THE GEOGRAPHICAL MAGAZINE

)LUME X, NO. 5 ONE SHILLING MONTHLY MARCH 1940

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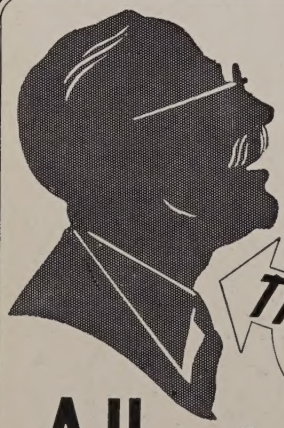

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The Cotswolds

by H. J. MASSINGHAM

To recognize only the aesthetic appeal of Cotswold country would be to ignore the spirit which inspired centuries of regional culture. Mr Massingham forbids any such easy appraisement; instead he exposes "a giant country and a deep-hearted one" in all its larger implications, and, while mourning its diminished glory, reaches out to the hope of a new culture as fruitful, and to mankind as beneficial, as the old

YEARS ago I lived on the Cotswolds; I have visited every village and hamlet in the north not once but a score of times; many of their traditional craftsmen are my friends and I have written three books about them. This is said not in a spirit of vainglory but as an oblique comment upon this article. When the editor suggested it to me, I was at first nonplussed, because, after years spent in the pursuit of Cotswold knowledge and in the satisfaction of my love for the country and its people, I find that I know enough about them to become fully conscious of how little I do know. The reason for this is that behind the facial characters of Cotswold country, which any traveller who puts on Bunyan's 'spectacles of observation' may perceive for himself, exists an intricate and hidden history, never recorded except in fragments by books, never so much as guessed at by the holiday maker, and extremely elusive of definition. It was because I became aware of this hidden history after a long period of intimacy, aware of it as a pattern, a unity, a secret rhythm to which the people, the landscape, the native stone, the husbandry and the architecture had all contributed, that I felt more than half inclined to refuse the editor's invitation. How was it possible to convey within a few pages even a consciousness in the reader that this unified background to the Cotswold scene is the momentous thing about it? Especially when the tragic degeneration of agriculture and country life, together with the exploitation of our rural heritage by the towns, have fallen so calamitously upon these ancient hills?

These hills are rapidly slipping back into sheer wilderness. Cotswold barley, once perhaps the very best in England owing to the light shallow calcareous soil spread over the bones of oolite limestone, is now a memory hardly more evocative than the teasel crops that used to be grown all over the hills for the Witney weaving industry. Those famous Cotswold long-wooled sheep that largely made England's fortune in the 14th century, of their millions there are now less than 300 left, the property of Mr Garne of Aldsworth. Hardly a single one of the old cider-mills now grinds the 'pummy' from the upland orchards that escape the late frosts occurring on the rich black loam of the Severn and Avon Vales. These old mills and presses in their stone-roofed outhouses are becoming as much antiquities as the weaving looms of the Stroud and other valleys that hedge in the many streams of the south.

The quarries of roofing stone—quite different from those whence walling stone, road stone and building stone were extracted—were once owned by the men who worked them, and this ownership descended in a direct family line from generation to generation. Now most of these quarries are grown over by the bent-grasses of the wolds and the craftsmen who dug the wafer-like 'pendle' out of them, left it to be frosted, split, stacked and drilled the thin slabs with the slat-pick, have not only lost their quarry-land but their jobs. The stone-slats (wrongly called tiles which are a manufactured article, not a natural product as is the pendle - stone whose surface is never touched) now slide off the roofs for lack of the labour to repair them.

Peter A. Ray

Four pictures showing four types of Cotswold stone buildings—a barn, a farmstead, a manor house, and a parish church—which are so extraordinarily well fitted to the landscape that they appear to have grown out of it. (Above) *View from Broadway Beacon.* (Below) *Farm in the Duntisbourne Valley*

J. Dixon Scott

Val Doone

House at Frampton Mansell built of the local stone, beautifully weathered and mellow. Cotswold buildings share certain architectural fundamentals and the resemblance in style between a homestead, such as that shown above, and a parish church, such as that of Evenlode shown below, is characteristic of the region

Peter A. Ray

The grand old stone barns are patched with corrugated iron and the fields are choked with thistles whose seed-heads float like drifting snow over the once-native roads, now coated with black tin-slag. The noblest of the woods have been felled, particularly that landmark-belt of beeches which screened Chedworth and its Roman Villa from the winter winds and the parts of Guiting Great Wood in the north-west where the lilies of the valley grew.

The plough rusts in the skeletal out-house through whose exposed rafters drops the rain and in countless places the rabbits skin the sheep-walks once trodden by sheep to whose numberless multitudes Shakespeare, Drayton, Defoe, Harrison of the *Description of England* and others have testified. Almost the last I heard of the traditional life of the wolds was that the yearly ploughing competitions at Dorn on the heights outside Moreton-in-the-Marsh had been abandoned for the first time in donkeys' years.

This is a melancholy epitaph upon that wonderful regional culture whose most obvious memorials today are the stone buildings of the hamlets, villages and wool towns. If we count in such rarities as the house of William Grevel, the wool-stapler, at Chipping Campden, these houses belong to six centuries, from the 14th century to the 19th. On the casual wayfarer they leave an immediate impression of extraordinary fitness to the landscape out of which they grow rather than in whose setting they are placed; of the beautiful weathering qualities of the pale buff or golden or dove-grey stone, which of course is the local oolite limestone, and of the unerring rightness of the proportions in the relations of lengths to gabled breadths, of window-lights to wall-space and of the sharply pitched roofs (to take off the weight of the stone-slats) to the walls. Behind these impressions lies a long traditional background of which they are the visual result.

In the first place, all these buildings, cow-byre, 'hovel', barn, cottage, farmstead, manor house and last but by no means least, the parish church, all are seen to be members of a single hierarchical society. Not only was just as much pains devoted to the building of a granary as of a manor house but all the buildings have certain architectural fundamentals in common. They are in fact the product of a definite regional style that differs from all other expressions of the *genius loci* in the English countryside, even in those districts of Dorset, Somerset, Oxon, Northants, Rutland, Lincs and Yorkshire through which runs the same limestone belt.

This style has no book-name and for want of a better denomination I call it a modified or regional Gothic, and for this reason. At its richest and most dynamic, from the 15th to the 17th centuries, it was a secular development of ecclesiastical building and that is why the small parish church preceding the prouder, more ornate and sometimes pretentious churches of the wool boom in the 15th century, bears so close a resemblance to the homesteads or barns (Cotswold is, or was, extraordinarily rich in tithe barns) in its neighbourhood. But the arresting thing is that this local Gothic continued right through the classical period of which Inigo Jones's Gateway to the Manor at Stanway, quite incongruous with the authentic Cotswold architecture, is a salient example.

There is indeed no real structural change between a Cotswold house built in 1400 and another built in 1800. The line of tradition is continuous and unbroken, by which I do not mean that no concessions and adaptations were made to the new classical fashion that came in with the Renaissance. A living style is a fluid and receptive one, and accordingly we find that in the 17th and 18th centuries the classical porch and doorway and the bow window appear upon typical Cotswold façades, while the sash window replaces the mullioned round-headed lights of Cotswold Gothic. On the other hand, where the Cotswold mason was required to build

revel's House, Chipping Campden, a 4th-century example, rare in its per-ction, of Cotswold 'Gothic' architec-ure. Too many of such buildings uffered, in the 17th and 18th centuries, ne incongruous addition of 'classical' orches, doorways, and bow windows

Brian C. Clayton

nigo Jones' Gateway to the Manor t Stanway belongs to the classical eriod, and violently contrasts with the uthentic Cotswold style which persisted vith modifications through six centuries

Will F. Taylor

Though it has a Renaissance porch, the Jacobean manor house at Upper Swell s patently Cotswold in style and shows hat local masons while adapting quite lien designs were nevertheless domin-ted by native architectural tradition

Packer & Son

a Queen Anne or Georgian mansion in the country, you find that his native style was so much in his bones that he modified the uniform style imported from abroad to suit it, flattening the pilasters, reducing the pediment and so on. The manor house at Upper Swell on the little Dickler River is a perfect example of this graceful deference on the part of an urban and fashionable style to the power and beauty of a purely local one, while Daneway House in the South Cotswolds and Jacobean House at Winchcombe, the old capital of the Mercian kings in the north-west, are instances of the local style absorbing into itself certain classical details.

What the vitality and strange magnetism of this local culture were may be illustrated by one of the most fascinating buildings in England, alas, all in ruins today. That is the Roman Villa in Spoonley Wood, halfway up the steep flank of one of the wold-buttresses to the Winchcombe Gap. The complex of buildings were all of the local stone and the roof of the granary was of stone-slats fitted upon the roof according to the customary Cotswold technique, and it is a very special technique. Not only that but the mosaics of the tessellated floors, the barn, the capitals of the verandah columns and the timber overhang above it were far closer to Cotswold Gothic than to the Italian architectural forms of the 1st century A.D.

When I met a phenomenon so astonishing as this, I felt inclined to think that the spirit of the hills, the nature of the stone and the character of that generous, swinging, nobly-modelled landscape shed an influence over all the builders down the ages and conveyed to them the manner and idiom of building in the Cotswold style. This is a step nearer understanding the deeply unified and continuously recreative genius—so utterly different from our modern notions of 'progress'—which inspired the old craftsmen from the Romans to the Victorians and from Bath to Chipping Campden.

But it is only by a closer scrutiny that you begin to perceive the length and breadth and depth of the cultural interplay and interlinkage. Ten years ago, when I was always wandering over the shoulders of these great dips and curving crests of highland, here maned and here bearded with beech-woods, I always had in front of me the pale white or buff or amber-coloured by-roads ribboning the plateau or climbing the bluffs in great curvilinear sweeps to vanish among the clouds. Nearly all are gone now, tarred over with the odious tin-slag, but they are still printed upon my inward eye because they played an integral part as a nerve system of the wolds. Nearly always they are girdled in by dry-stone walls and nearly always the meadow crane's bill, the largest of our wild geraniums, imparted to the flora of the grassy margins a blue tint in July that went on for miles as a kind of purplish-blue fillet beside the golden roads.

The wolds are very rich in wild flowers, the bee-orchis and sometimes the pasque flower on the open wolds, many orchises, habenaria, helleborine, hellebores, lilies of the valley, herb paris and even the wild martagon in the upland woods. But the meadow crane's bill has always seemed to me the flower of the heart of the hills, and one reason is because its limpid colouring has a particular glow and purity against the grey stone of the field walls, especially when the sun pours its rays directly into the open chalice. It possesses this subtle relationship equally with the open sky, the open wolds beneath its canopy and the bones of the land, the limestone which has shaped the roll of the hills and as it were guided the hand of man in the flowering of his stone-craftsmanship for two thousand years.

Actually, it has been twice this length of time. Dry-stone walling has been a Cotswold industry with a peculiar technique of its own (which I have frequently watched) from 2000 B.C. onwards. At

Peter A. K

'*The pale white or buff or amber-coloured by-roads ribboning the plateau*'

'*Meadow crane's bill, a kind of purplish-blue fillet beside the golden roads*'

Peter A. Ray

On the road from Guiting Wood to Farmcote: a Cotswold barn at Pinnock Farm

that time, the Neolithic builders of the long barrows, so numerous on the wolds, built the underground horns to the portals of these barrows with thin bread-and-butter slabs (you might call them) and a refined technique which has never been surpassed in any subsequent age. How came these first colonists and sheep-herders of the wolds to acquire this highly dexterous, elaborate craft without the apprenticeship and hereditary tradition which are the secret of all craftsmanship? But then how came the Romans to build in Cotswold Gothic a thousand years and more before the Gothic age?

Nobody builds these walls today; there are hardly any wallers left even to repair them (one of the best and last of them recently 'went to heaven', as he said), but the continuity of this tradition was maintained through 40 centuries until the Machine Age put an end to it. And nowhere more brilliantly than in the mediaeval tithe barn. One of these barns, that of Middle Littleton in the north, was built entirely of these mortarless slabs superimposed one on another, not only an astonishing masterpiece of craftsmanship but yet another indication of the profound unity of the Cotswold culture. Changing its forms, it was yet unchanged, always the same and yet ever renewed, faithfully traditional and yet persistently creative. The mere experience of contemplating from a distance so richly interwoven a tradition is a most searching criticism of the anarchy and despair that progress has brought upon the world.

One of the immortal stories of the past is of Nausicaa playing ball with her maidens on the sea-shore. The Cotswold limestone that welcomes the sun and the chisel but bolts out the weather and the years is as it were the Nausicaa of that intricate whole. But the complicated

Peter A. Ra

In the lonelier wolds near Condicote: a Gloucestershire hoop-raved painted waggon

interchange of cultural elements—the game of ball—has failed to survive the new world made by the Industrial Revolution and so the fire of life burns within the hills no longer. Here is an example of that interdependence which is always leading the watcher of the pattern on from one thing to another and in the end back to the place he started from.

'As sure as God's in Gloucestershire' is an old saw that may refer to the great number of religious houses built on these storied hills. The stone walls that border the old roads—Buckle Street from Saintbury to Bourton-on-the-Water, the Roman road to Condicote, the roads from Ford to Snowshill and from Guiting Wood to Farmcote, the White Way, the Welsh Way and the others—link the quarries with Middle Littleton Tithe Barn; this carries the memory to one of the noblest tithe barns in England, that of Great Coxwell, built in the Cotswold style; that again to the Cistercian monks who built it; they again to the Cotswold sheep; the sheep to the sheep-walks of the wolds and the sheep-walks back to the stone.

The Cistercians were the great architects of the 13th century and on the hills and over the great Vale between them and the Welsh mountains they set up such masterpieces as Tintern, Hayles, Kingswood, Flaxley and others. They were also the principal sheep-breeders of the Middle Ages and there is good reason for the inference that the breed of Cotswold sheep with their 'good Cottyswolde woll' was the consequence of Cistercian experiment.

There is no sheep in the world that possesses (soon we shall have to say possessed) so gallant and dignified a mien, so glistening and indeed golden a fleece with the lovelock over the brow, still shorn and folded in the traditional manner and still ochred by hand. Yet it was these sheep

whose richness of fleece was the first cause of the dislocation of the old balanced husbandry of the Cotswolds between arable and sheep pasture. The Jasons of the early Renaissance, namely the courtiers of the first Tudors, sought these golden fleeces so avidly that they enclosed the arable strips of the open-field villagers, turned them into sheep-runs, depopulated whole villages and set in motion that lamentable drift from the country to the town which has cankered the very heart of England.

In the 14th century the Cotswolds *were* the heart of England and about these pivotal crafts of husbandry, sheep-rearing and stone-building, grew up a host of allied crafts that radiated from them in the measured order and mutual magnetism of a planetary system. In my museum I have a large collection of the tools and implements used in these dead or dying crafts, among them a breast-plough still used on the potato-fields, a wooden wheel-less swing-plough in use when I was a child and identical with that described in Fitzherbert's *Boke of Husbandrie* of 1548, an 'ox-queue' from the foot of the sole surviving ox team at Cirencester Park in England, and a Gloucestershire hoop-raved waggon, made of oak, ash and wych-elm and painted in the traditional colours of yellow, orange and ochreous brown.

Charlie Kite of Paxford in the northern foothills is one of the very last of the old wheelwrights, and the last time I went into his yard he was painting the hoop-raved waggon that bore his father's name and the date—1866—of its making.

I have only to glance round the walls of my rural museum to see an assemblage of Cotswold objects—sheep-shears, slatting picks, rules, hammers and 'jads' for quarrying and roofing; fining hammer for breaking the stones for the roads and walling hammer for the dry-stone walls; adze, pit-saw, fromard, augers and the like that framed the timbers of the church-like barns; sickles, crooks, cow-bells, flails, seed-lips or hoppers that depict the life of the fields; ornamental 'dollies' in woven straw from the corn-ricks which open out as on a scroll the immemorial rituals of harvest. Behind these heirlooms of a great tradition existed a stable and contented society moulded by and moulding a particular countryside in mutual co-operation, the beauty and facilities of the one evoking the best creative energies of the other.

The very shapes of these tools and the designs of the works of cottage crafts have an affinity with the carvings in wood and stone upon the ancient churches, those on the tympana of the Norman porches at Condicote, Naunton, Withington, Bisley, Elkstone, Quenington and elsewhere, on the fonts of Overbury, Southrop and Deerhurst and along the string-courses of the 15th-century parish church at Winchcombe. The Winchcombe figures draw the parallels yet closer since as near as may be they are portraits of the Rabelaisian rustics, folk-tales of whom have been told me in dialect round the fireside of many a Cotswold inn. The Cotswold village has become so celebrated that it is a commonplace of the guide-book. Yet I do not remember having read any mention of one particular virtue in their admitted beauty, namely, their layout or *siting*. It is an art entirely lost today and no amount of town-planning or architect's *expertise* can ever bring it back again. It was a folk-quality as unerring as it was instinctive, that is to say, inherited through the generations of craftsmen. The first distinction you notice is that between the upland villages set like a tuft of trees on the open plateau and those strung along the river valleys. The former are compact, the cottages cluster together against the winds and the intuitive design is often geometrical. Turkdean on its cliff north of the old wool town of Northleach; Condicote where the roads, converging upon it in the middle of the lonelier wolds, are 'so desperate twisty'; Cold Ashton grouped about its sycamore tree,

The font in the church at Overbury near Tewkesbury. The bowl is thought to be Norman and the figure that of Ealdred, Bishop of Hereford as well as Worcester, hence two pastoral staves. He was later Archbishop of York and is said to have crowned William the Conqueror at Winchester because Stigand, Archbishop of Canterbury, had opposed the monarch. The manor and church of Overbury were given to the Priory of Worcester by one of the early Saxon kings of Mercia and the church has belonged to the Priory and Cathedral ever since

Peter A. Ray

Peter A. Ray

A largely unrecognized virtue of the Cotswold village is its layout or siting. Stanton (above) *illustrates the perfect compromise between the clustering wold- and the more open valley-village. Note the pattern of projection and recession in the farther houses. Calcot* (below) *a closely grouped wold-village*

J. Dixon Scott

Peter A. Ray

Lower Slaughter (above) *though a valley-village is neat rather than straggling and lies astride a tributary of the Dickler over which little stone bridges are set at intervals. Bibury* (below) *conforms to the valley type and is grouped casually along the banks of the river Coln, a famous Cotswold trout-stream*

J. Dixon Scott

the navel of the whole; Snowshill on the edge of the brow of the wolds looking out towards Bredon and the Malverns across the Vale; Calcot above the Valley of the Coln—these are all examples of the disposition of the hill village. Calcot is only a mile or so away from Bibury, and yet there is all the difference between their respective layouts. Bibury, on the banks of the most famous of all the Cotswold trout-streams, is set out very loosely and cunningly-casually on both banks of the pellucid stream; Calcot is wrapped up warm and close.

There are any number of subtle variations between these two extremes. How different, for instance, is the effect of Lower Slaughter disposed on both sides of a tributary of the Dickler with almost too formal and well-dressed an air, though the cottage gardens and the little stone bridges across the leisurely water sweeten the self-conscious appearance. Upper Swell comes down to the Dickler in a perfect conciliation between the upland and the valley type of village. Yet Stanton, perhaps the most beautiful and certainly the best-preserved village in the Cotswolds, solves the same problem of finding a compromise between the clustering of the wold village and the open formation of the valley village in quite a different manner. It points direct at the shaggy height at the end of it (Shenberrow Hill) along a single street but with slight lateral undulations along its course. Chedworth is another of these half-and-half villages, both upland and lowland, and it in its turn offers a third solution in spacing and arrangement. The cottages are grouped in triple strata down the slope with feelers thrown out into the great spaces of the wold plateau. Thus it is not only a kind of terraced village but exquisitely strikes the balance between belonging to the wolds and detachment from them.

I could give many other examples of the variety of adaptations of means to end, the supreme quality of craftsmanship above all others. But I will content myself with the crown of them all, Chipping Campden, the sole market town in England where the traditions of the old craftsmen who made it are still kept, so far as may be in an age of mechanization, in zealous and loving memory. Campden is simply one long street, like Stanton, with two offshoots, Sheep Street (for the little town was built out of wool) and the street of the church and the burnt manor where the Almshouses are, built (in the warm spirit of local charity) like a palace.

This long street and its tributaries with it, containing five centuries of the regional architecture, illustrate the most delicate and the most masterly blend between the straight line and the curve that occurs anywhere in Europe and perhaps in the whole world. And this wonderful embrace of opposites, each yielding to the other without losing its own essence, is caught up by the nature of the houses themselves. The structural lines of Cotswold architecture are always simple and bold; they are as far as possible from the baroque, the French 'flamboyant' Gothic and the Italianate Renaissance. But if Campden be examined from door to door, it will be seen that it contains a wealth of ornament—in finials, sundials, the mouldings of oriel windows, wrought-iron work, stone urns, brackets with carved faces and the like—which supplements but in no way interferes with the linear freedom, breadth and sharpness of front, gable, roof and chimney-stack.

I do not think it is altogether a fancy to see in these clear, virile and perfectly proportioned lines a rendering in terms of domestic building of the equally simple and spacious rotundities of the wolds themselves. Except in one detail the principle of roundness in the countryside is answered by the rectangular principle in the cottages, barns and manors. This exception is the 'valleying' of the roofs at all the angles of intersecting planes,

Aerofilms

From the air: Chipping Campden, through which runs perhaps the most beautiful street in Europe, curved like a Cupid's bow, with a history covering five centuries. The 'wool' church reflects the magnificence and prosperity which Cotswold sheep brought to the market town

namely, curving them by a special process. When you see them together, the acute angles of the grey or golden-brown houses against the flowing amplitudes of the downs or the curling, softly chiselled groovings of the valleys or the clouds of woodland cloaking the flanks of the hills, then you know that there has been a perfect translation from Nature to man, and that though the form is different the spirit is the same. Perhaps it is on the great slopes above Winchcombe, away from Hayles Wood (now cut down) to the Guitings and Roel Camp, the territory of the old county of Pinnockshire wherein they once grew tobacco, that the generous harmonies of the landscape of the Cotswolds are best appreciated. Nothing is prettified in that landscape—it is too austere for that. But in spite of its epic quality (and a few of the hills, Cleeve for instance, being over a thousand feet, are entitled to the status of mountains), it is never harsh nor forbidding nor estranging, though its more luxuriant beauties are hidden in the valleys and combes. It is a giant country and a deep-hearted one, and ever since man has occupied its swelling ranges under its great skies, he has worthily represented its noble forms and free spaces in his own works. That is the key to the Cotswolds—the intercommunion between man and Nature in the infinitely varied achievements of craftsmanship. The stone is the link between the human and the natural scene; it has inspired man and formed the hills. Perhaps one day man will return to his senses and, shocked by the awful consequences of his idolatry of material progress, will find peace once more in the country he has violated. Then a new culture will rise upon the Cotswold hills, as durable and as satisfying to body and soul as the one whose dying flicker we see in our own time.

The Story of the Suez Canal

'Jugular Artery' of the British Empire

by RENÉ ELVIN

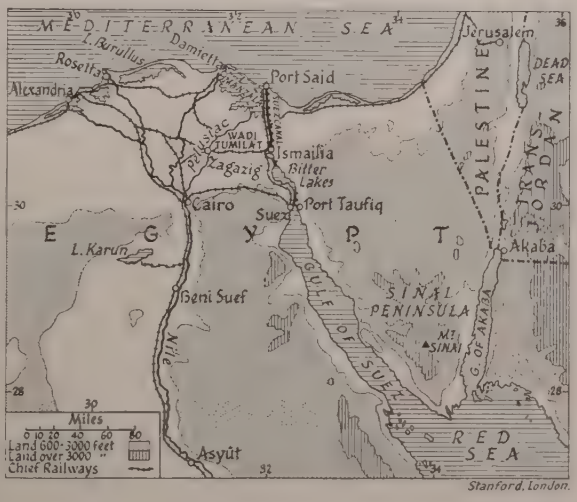
GEOGRAPHICAL crossways have always been crossways of history. This is especially true of the narrow isthmus which links Asia with Africa and which is at the same time the main station on the shortest sea route between East and West. Yet so short is the memory of mankind that, when one thinks of the history of the Suez Canal, one scarcely goes further back than to the seventy years which have elapsed since its inauguration, or at best to the few decades preceding its opening. It is true that this short period had been particularly eventful, but we should not forget, in this 20th century, that the canal was the subject of earnest discussions between Pharaohs and engineers as early as the 20th century B.C.

The merest glance at a map will show that the idea of cutting a canal between the Red Sea and the Mediterranean, there distant only seventy-five miles as the crow flies, was such an obvious and inviting one that it must have occurred to the earliest traders and sailors in these seas: the Gulf of Suez seems almost to point a finger in the direction of the North, a finger which, in ancient times, was further extended by a long 'nail' in the shape of the Bitter Lakes, now part of the canal, but then a direct extension of the Red Sea. The technical problem was not too difficult, as one of the Eastern branches of the Nile delta, the Pelusiac, had but to be prolonged through the green and fertile belt of the Wadi Tumilat and then to be turned southwards in order to reach the Bitter Lakes, *i.e.* the Red Sea.

We have it on the venerable but not very safe authority of Aristotle, Strabo and Pliny, that the work was first undertaken by Sesostris, a famous Pharaoh of the 12th Dynasty. (That, according to modern Egyptologists, this fabulous Pharaoh never existed and was only a traditional compound of Seti I and Rameses II, belonging to the 19th Dynasty, or that, if we believe other authorities, his name was corrupted from that of Senwosri II of the 12th Dynasty, is neither here nor there and of strictly academic interest.) This canal was eventually completed and was in constant use for a couple of centuries but, some time before

the beginning of the 7th century B.C., it became neglected and gradually silted up. In 612 B.C. Pharaoh Necho (better known to us as the victor over Josiah, King of Judah, at the battle of Megiddo) undertook to recut it and employed over 100,000 slaves on the labour, but gave it up when warned by an oracle that he was preparing the way for an invader. True enough, less than a century later, after the conquest of Asia by Cyrus, his son Cambyses, at the head of his Persians, conquered Egypt. It was one of his successors, Darius Hystaspes, who, in 521 B.C., restored and enlarged the Canal of the Pharaohs; a monumental record of this achievement, couched in the arrogant language of a true dictator, is still extant. Two and a half centuries later, under the Ptolemies, the canal again badly needed reconditioning, and the greatest ruler of this dynasty, Philadelphus, even had the idea of cutting it through the isthmus, thus anticipating Ferdinand de Lesseps by over 2000 years. Curiously enough, the fallacious notion that the level of the Red Sea was so much higher than that of the Mediterranean that it would flood the country if the two seas were directly connected (a notion which was to prevent the achievement of this object time after time right down to the 19th century), was even then the reason why another course through the Nile delta was chosen.

Under the Romans, the canal, newly baptized 'River of Trajan', was thoroughly cleaned out, given a better water supply by the main stream of the Nile, and thus made safe for another couple of centuries. Still, its vicissitudes were not at an end, for it again became derelict and, towards the close of the 3rd century A.D., it was again out of use. Yet, phoenix-like, it arose from its own ashes after the Arab conquest of Egypt in the 7th century and was reopened by its conqueror, Amr. Not for long though: reopened in the winter of 641–2, it was finally closed again in 1776 by another caliph as a protective step against the incursions of



insurgents from Mecca and Medina. And, for over a thousand years, the sands of the desert covered up the waterway.

Yet its utility was so obvious that, as soon as the Dark Ages were past and commerce began to flourish again in the Mediterranean, project after project was mooted with a view to its reconditioning. The Venetians, the Turks and the French in their turn toyed with the idea, but it never went further than the stage of reports and discussions. After the conquest of India by the British, they too entered the lists, and the rivalry between them and the French became so keen that it resulted eventually in Napoleon's expedition to Egypt in 1798. The canal idea was even then very much in his mind, as is shown by the fact that the staff of this campaign included a number of engineers and technicians led by a famous architect, Jean-Baptiste Lepère, who proceeded to survey the ground. Lepère, like the engineers of Ptolemeus Philadelphus 2000 years before, concluded against a direct canal as, according to him, the level of the Red Sea was over thirty feet higher than that of the Mediterranean. But, even if his calculations had been right, the French could hardly have made much progress with the actual building, as, after the battles of the Nile and of Aboukir, they had to leave the country.

19TH-CENTURY RIVALRIES

Among the officers who fought against Napoleon in these battles was a young Albanian, Mehemet Ali, who, by cunning and daring, was to make himself, in a very few years, the undisputed master of all Egypt and to render it practically independent of the Turkish Sultan. The new ruler was entirely illiterate, but full of wiles and ambition, and astute enough to plan 'reforms' which gave him in the western world a standing unparalleled by any other oriental monarch of his time. Among these, the canal project loomed large, but the interminable intrigues of which his court soon became a hot-bed delayed its realization for another half-century. Meanwhile, the disciples of a French peer, the Comte de Saint-Simon—the founder of socialism in France—became interested in the canal idea and devoted themselves with enthusiasm to propaganda in its favour, founding in 1846 the Société d'Études du Canal de Suez to study it in all its implications and to enlist the help of European capitalists in its support. Concurrently, French engineers appointed by Mehemet Ali, principally

Linant Bey and Mougel Bey, prepared detailed plans for the future [illegible] away with the fallacy about the difference in levels and

ERRATUM

On pages 143 and 147 of the January number it was stated that Bessarabia has a preponderantly Russian or Ukrainian population. In fact, the population of 2,864,000 (Rumanian census, 1930) is divided as follows, according to languages spoken (excluding a few small groups):

	Rumanian	Russian	Ukrainian	(Jews)	Bulgar	German
Percentage:	56·2	12·3	11·0	7·2	5·7	2·8

The last Russian census (1897) gives, out of a total population of 1,935,000, the following percentages:

Rumanian	Ukrainian	(Jews)	Russian	Bulgar	German
47·6	19·6	11·8	8·2	5·3	3·1

Meanwhile the canal project was in abeyance: Abbas had taken upon himself to give the authorization for a railway, which was an internal Egyptian concern, but the canal was a much more complicated affair, requiring the assent and guarantee both of the principal European powers and of the Sultan, Egypt's nominal overlord, and, as they never could agree, the whole matter was in a blind alley.

DE LESSEPS TAKES CHARGE

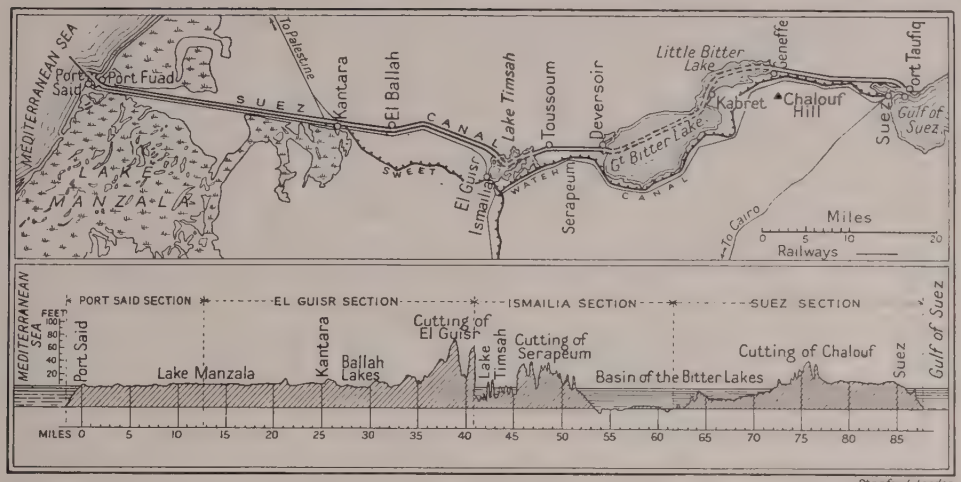
And then, as the hour was ripe, there arose the man who was to bring all these diverging efforts to fruition: Ferdinand de Lesseps. With indomitable courage, perseverance and practical sense, he combined imagination and a charm of manner which made him what was then most needed: the perfect diplomat. Moreover, he was *persona gratissima* with the heir to the throne, Said Pasha: his father, Mathieu de Lesseps, had helped Said's father, Mehemet Ali, in his rise to power, and the two sons had struck up a warm friendship. De Lesseps, in the early course of his brilliant career, had been Vice-Consul in Alexandria, and, while quarantined in that port before disembarking,

had read Lepère's report on the canal project: it immediately set his mind aflame, and the idea never left him until he transformed it into reality. On the accession of Said Pasha in 1854, he at once went to pay homage and, heartened by the warmth of his welcome, put his cherished project before the new Viceroy, who was straightway convinced that it could be carried out, and that his good friend Ferdinand was the man to do it. It was not only de Lesseps' influence, eloquence and obvious sincerity that carried the day, but also, curiously enough, his superb horsemanship, which the Pasha admired above all else. With unexpected readiness, the Concession for which the European powers had been wrangling for so long was granted to an individual; first, provisionally, on November 30, 1854, and then, formally and definitely, in January 1856.

But the difficulties were only beginning. After years of protracted negotiations, and weary with waiting for the ratification of the Concession, which the Sultan withheld to please London, de Lesseps, having vainly pleaded in person with Lord Palmerston, who persisted in his short-sighted policy, proceeded with his plan. The first stage was to obtain the necessary capital for his Compagnie Universelle du Canal Maritime de Suez. As the name implies, his intention had been, both for idealistic and practical reasons, to appeal equally to capitalists of all countries: in his mind, the canal was to be not only a business proposition, but a link between all seafaring nations. The inimical attitude of the British Government, however, deterred the English public, and more than half the shares of the initial capital of 200,000,000 gold francs (= £8 millions at pre-1914 rates) were subscribed by the French, as much as a gesture of defiance and protest as for investment. Eventually, in 1860, Said Pasha himself was persuaded to take up the remaining unallotted shares.

THE ENGINEERS BEGIN

Never had an engineering undertaking, which in reality offered no unusual difficulties, been beset with so many imaginary obstacles. However, fortified by the enthusiastic success of the issue of shares in France, de Lesseps went ahead, and in April 1859 work was begun. The obvious line for the canal to take was indicated by the formation of the ground: a natural depression ran across the isthmus, the lowest part of this embryo canal being formed by the basin of the



Stanford, London.

dried-up Bitter Lakes and at only a few points did the ground rise above sea-level.

The engineers decided to start work on the entrance to the canal from the Mediterranean, in order to secure a base for their operations and a landing-place for their supplies. A breakwater was thrown out into the sea, to form a rudimentary harbour and to prevent the deposits brought down by the Nile from silting up the canal as it was being built. De Lesseps named this forlorn spot Port Said in honour of his friend and protector. The very soil of this now thriving and well laid-out city of over 100,000 inhabitants had to be dug from the mud of the shallow lake and spread over the shifting marshes, where it was baked hard by the sun, to form the foundation of the workshops which were the first buildings to be erected there.

In this wilderness of sand, the work was at first desperately slow: a fresh-water canal had to be dug all the way from the Nile in order to provide drinking water for the thousands of labourers who were later to be employed in digging the main canal, and this alone took about four years. It had further been decided that the maritime canal should first of all be 'sketched out' by digging a miniature channel only a few feet deep from end to end. This would then serve as a waterway for transporting men and materials needed to carry on the preliminary work, and was later on to be deepened and enlarged by dredgers. The design of these was to arouse much contemporary admiration on account of what was then considered their audacious novelty: each was a kind of enormous mud pump which discharged

the material excavated from the canal through a long spout onto the banks, instead of into lighters as was usual.

From the breakwater at Port Said the canal had to be carried to Kantara, the first point on the mainland, across a plain of liquid mud laid down by the Nile. The difficulty of getting this mud to hold was laboriously overcome by the local natives who knew how to deal with it: they simply scooped up large masses which they squeezed dry by pressing it against their chests. They then stacked up the lumps, letting each layer bake hard in the sun before adding another. This part of the canal accomplished, the only serious obstacle between them and Lake Timsah was a huge sandy plateau, El Guisr. Opponents of the scheme said that the sand would surely engulf the workmen as they dug, but by 1861 the 9-mile channel through the plateau was, though by no means completed, at least passable, and Lake Timsah reached. At this central point the engineers established a small village of chalets, Ismailia, from which the workers could radiate in either direction. Today the navigation of the canal is controlled from a central office at Ismailia, now grown into a gracious and pleasant garden-city of 40,000 inhabitants.

MEN—AND MACHINES

Then, in 1863, fresh trouble arose. One of the clauses of the Concession had been that four-fifths of the labourers employed should be Egyptians, whom Said Pasha undertook to supply, while the Canal Company was to house, feed and pay them at stipulated rates, definitely better than those prevailing at the time in Egypt for similar labour. To this clause, on the grounds that it involved forced labour, England objected. Unfortunately for de Lesseps, in the midst of this agitation, his friend and protector Said Pasha died and was succeeded by Ismail, who upheld the British point of view, as he hoped in this way to recover some of the territory ceded to the Company by Said. In the end, the matter in dispute was referred to the arbitration of Emperor Napoleon III and settled, after long-drawn-out discussions on the basis of the retrocession by the Company of the fresh-water canal against an indemnity of 16 million gold francs, and the abolition of the 'pressed' labour, or *corvée*, against one of 38 millions.

This proved to be a blessing in disguise, for it compelled the builders to replace manual labour by mechanical appliances and modern

engineering methods. The work was allotted to several specialized sub-contractors, and from then on proceeded fairly smoothly. The contractor who had undertaken to excavate the Serapeum plateau utilized the greater elevation of the fresh-water canal over the maritime to introduce dredgers onto the plateau. These tactics overcame what had appeared a most formidable obstacle, and at last the canal reached the Bitter Lakes.

Between these lakes and Suez, which owing to the fresh-water canal and the construction of docks had grown from an insignificant Egyptian village into a busy port, rose only the Chalouf hill. Here a great mass of rock had to be cut into, and it was therefore the last part of the canal to be completed.

There were, however, still headaches enough left for Ferdinand de Lesseps: for one thing, the work turned out to be far more expensive than had been anticipated: up to the end of the year 1869, the expenses of the Company showed a total of nearly 433 million francs, whereas the experts had estimated the cost at only 200 millions for a canal of larger dimensions. De Lesseps had to barter away some of the privileges and rights conceded to his Company by the Egyptian Government against loans and ready cash.

THE OPENING DAY

By November 1869 the canal was ready for traffic. The Khedive, to celebrate the occasion, invited all the nations of the world to send their representatives to the inauguration and entertained them at his own expense, with the help of 500 cooks and 1000 servants brought over from France and Italy. The first passage of a number of great ships through such a narrow channel was a hazardous experiment, and 15 days before the opening the engineers found that they had missed a great boulder rising up 15 feet from the bottom of the Chalouf cut. De Lesseps sent for gunpowder from Cairo, vowing that something should blow up, either the rock or himself. Then, no sooner had he reached Port Said to welcome the distinguished visitors and attend the blessing of the enterprise, than news was brought that an Egyptian frigate had run ashore and lay across the canal completely blocking traffic. Whilst seamen worked desperately all night to clear the way, a great, expectant gathering of ships lay inside the

breakwater. As evening fell the darkness was festooned with lines of lanterns hung from mast to mast and up and down the rigging. Lights shone at every porthole, tar barrels blazed along the harbour and flights of rockets showered down golden stars. Next day a gaily beflagged fleet of 67 ships, headed by the French Imperial Yacht *Aigle*, with the delighted Empress Eugénie on board, left Port Said and entered the canal at eight o'clock in the morning. At 4 P.M., the ships were moored in Lake Timsah, opposite Ismailia, where the Khedive offered his guests a sumptuous feast; on the 19th, the journey was resumed between Lake Timsah and the Bitter Lakes, where the flotilla cast anchor; on the 20th, at half-past eleven in the morning, *L'Aigle* entered the Red Sea.

England, having failed in her attempt to prevent the building of the canal, showed herself a good loser by joining in the congratulations and by bestowing on de Lesseps the Grand Cross of the Order of the Star of India and the freedom of the City of London.

In spite of the honours showered on him, de Lesseps was still a much-worried man. The traffic was at first less than expected and, during the first two years, the receipts were therefore considerably lower than the expenses, so that the Company came dangerously near to bankruptcy. Already scurrilous lampoons prophesied the utter ruin of the Suez Canal and people began to discuss what would happen if this really came to pass.

DISRAELI BUYS FOR ENGLAND

The Company tried to increase income by levying the dues, which had been fixed by the original Concession at 10 gold francs per ton, on gross register tonnage instead of net, but this was prevented by the agitation of British shipowners, whose objections were sustained by the Turkish Government. Fortunately for every one concerned, a compromise was arrived at, the traffic began gradually to increase, and, in 1875, the Company was able to distribute a first, modest dividend. It was in the same year that the famous deal took place, which was to give Great Britain a paramount interest in the canal and to have, indirectly, far-reaching consequences on her political relations with Egypt: on November 25 of that year, Disraeli, on behalf of the British Government, bought the Khedive's 176,602 shares of the Canal Company for 100,000,000 gold francs (£4 millions). Thanks to

'Dizzy's' genius for self-dramatization, this simple and eminently profitable business transaction has somehow assumed a melodramatic aspect which it never had at the time, except for the unexpectedness and rapidity of the proceedings. The facts are by now known to everyone, so that it is not necessary to relate them here in detail: the Khedive, by his extravagance, had fallen heavily into debt. His French bankers, whom he first approached for a loan on the security of his shares, could not see their way to letting him have a loan, but suggested buying the shares outright. They could not, however, find the money quickly enough, and this is where the British Prime Minister stepped in: on November 17 he let the Khedive know that he was disposed to purchase the shares, and, a week later, having persuaded his doubtful Cabinet colleagues to give him their assent, he closed the deal. From the financial point of view, it was one of the most successful transactions ever made by any government: the sum invested has since been repaid about ten times in dividends and interest, and, at the rather low quotations prevailing at the end of 1938, its capital value was still worth ten times the amount paid!

INTERNAL AND INTERNATIONAL REPERCUSSIONS

The canal and the financial situation of the Khedive soon became the focal point of internal Egyptian, as well as international European, unrest. Despite the sale of his shares (or perhaps on account of it!) the Khedive got himself more and more entangled in money difficulties, and was eventually deposed. This, however, did not end the trouble, and, under his son Tewfik, it was made worse by the rising anger of the natives at the attempts of foreigners to control the country by means of its finances. In 1882 riots broke out in Alexandria, in the course of which over fifty Europeans were killed. The revolt soon assumed such proportions that the Khedive, after vainly asking the Sultan for troops to quell the disturbances, had to appeal to France and England for help, who sent warships for 'peaceful demonstrations'. As these proved useless, and the rioters were beginning to build fortifications and to menace the canal, sterner measures became necessary. The French Cabinet, however, would not undertake responsibility, and it was left to the British to act. They bombarded the forts of Alexandria and occupied the town—in the nick of time, as it proved, for the leader of the insurgents, Arabi Pasha, had just given orders to wreck the canal.

This was the beginning of the British occupation which, in one form or another, has lasted until now.

This is not the place to give a historical account of these political developments. It must suffice to say that their upshot, as far as the canal is concerned, was the International Convention of October 29, 1888, which guarantees in its first article that "The Suez Maritime Canal shall always be free and open, in time of war as in time of peace, to every vessel of commerce or of war, without distinction of flag". It is still the international law ruling the canal, and everyone remembers how large it loomed over the discussions concerning the sanctions against Italy at the time of the Abyssinian war. During the Great War of 1914–18, the canal, considered by the Germans to be the 'jugular artery' of the British Empire, became an important object of attack when Turkey became Germany's ally. On February 3, 1915, a force of some 5000 Turks delivered a bold stroke against the Canal between Lake Timsah and the Great Bitter Lake: their artillery nearly succeeded in sinking H.M.S. *Hardinge* and the French battleship *Requin* in the fairway, but their attempts to cross it were thwarted, though three Turkish pontoons reached the African shore, only to be captured there by the British troops. To forestall further attacks, the campaign in Palestine was decided upon and relieved the canal of all further menaces.

SPEEDING THE COURSE

Passage through the canal is now, of course, much quicker than it was at the time of the opening, when the total transit time was over 48 hours, including 17 hours of navigation and more than 30 hours of stops and moorings: the fastest transit time is at present slightly over 11 hours, the ships being allowed to proceed normally at 7 knots, by night as well as by day. The course of every ship is plotted out as it enters the Canal, and the time at which it will reach each of the 14 stations determined. Thanks to the numerous enlargements and improvements, navigation is now perfectly smooth, and mishaps are extremely rare. Such measures of precaution as the compulsory taking aboard of expert canal pilots, the prohibition of overtaking, the obligation of slowing down or stopping altogether whenever there is not a clear passage, further contribute to the safety of passengers. But in spite of this it is still a curious and exciting experience to come up out of the great Indian Ocean, and suddenly to find the desert lies

about you close on either side, so that you seem to have only to lean from the deck to touch with your hand caravans travelling the ancient routes to Syria and Mecca. Or to throw off in a breath at Port Said the environment of Europe, as the great statue of de Lesseps points your way to the East in his own magnificent words: "*Aperire Terram Gentibus*".

The history of the past 4000 years bears witness to the importance of the waterway re-built by the genius and perseverance of Ferdinand de Lesseps. Another, and just as conclusive, proof is given by the growth of traffic through the canal since its creation, which was continuously increased with only one major drop during the last World War: not even the depression of 1930–34 could affect it permanently. Far and away the most important client of the canal is Great Britain, whose share of the traffic has been generally 50 per cent or more. During the period of 1931–8 Italy (owing to the war traffic of the Abyssinian campaign), Germany, Holland, France and Japan were next in importance.

A HIGHWAY OF NATIONS

The widening and deepening of the canal, which now allows ships of over 40,000 tons, like the *Empress of Britain*, to pass through unhindered, and the gradual reduction of the dues, have made this route not only the fastest, but also the most economical line of transit between Europe, the East and Australia for goods, passengers and mails, though in the last few years air traffic has begun to take its share of the last two categories. The canal has been the strongest link in the relations between Egypt and Great Britain: in fact, it is only for the protection of this vital passage that British troops are still stationed in the virtually independent Egypt of today. When, thirty years hence, the canal becomes the free property of the Egyptian Government and nation, it is confidently to be expected that it will remain, as it has been for the past seventy years under the trusteeship of the Company, one of the main highways of nations, open to all on equal and fair terms, for their mutual benefit and for the greater progress and prosperity of the whole world.

Latvia and Estonia

by The Very Reverend A. S. DUNCAN-JONES

Not only in our own days have the Baltic peoples stood exposed to the fury of turbulent neighbours. Since the Middle Ages, and the days of the Hanseatic League (itself a defensive alliance against aggressive enemies) to which so many Baltic cities were affiliated, their history has been anything but peaceful. But through wars, invasions, suppression, the people of Latvia and Estonia have preserved their soul as well as their identity and, as twenty-one years of independence have shown, their capacity for freedom and progress

THE development of the war has made Latvia and Estonia familiar to many English people who not so long ago would have been uncertain whether they were in the Balkans or on the Baltic. This ignorance is not surprising as the Latvians and Estonians were for 700 years largely dominated by alien powers. They would never have won their freedom had not both their great neighbours, Germany and Russia, been defeated in the war of 1914–18. I visited these lands in an official capacity in 1938, and was so much attracted by the charm of the countries and the vigorous, friendly character of the peoples who have in 21 years built up flourishing free states that I returned again in July 1939.

The first time I went by train via Berlin and Königsberg, a tedious method. In 1939 I went by sea. The journey takes longer. But the traveller spends very pleasant days as one of six passengers on the well-found cargo boats of the United Baltic Corporation. As we entered the Kaiser-Wilhelm-Canal at Brunsbüttel we had a glimpse of German warships at Cuxhaven. As we left the Canal a more distant view was obtained of still more formidable naval vessels outside Kiel. On the fourth evening we arrived at the mouth of the Daugava. Riga, one of the greatest of Baltic ports, 12 miles away, threw up its spires grandly into the twilight, which in July is hardly night in those regions.

Riga is a meeting ground of cultures, summing up the history of Latvia and indeed of Estonia, which are, so to speak, the Belgium of Eastern Europe. For centuries wave after wave of invaders have swept over these lands, invaders who, as they receded, left some mark of their presence behind. The descendants of the original inhabitants are among the oldest races in Europe.

The Latvians belong to the same group as the Lithuanians and the original Prussians. The language of these peoples is a very pure derivation of the earliest Indo-European. The Prussians were completely wiped out in the 13th century by the Teutonic knights who took their name and their country for *Germanentum*. The Latvians and Estonians were merely subdued by the oncoming Germans. The process was called Christianization. Conquest and conversion were interchangeable terms. The result was a ruthless German tyranny, which lasted up till the war of 1914–18. When their German masters turned

The range of spires on the water-front at Riga. On the left, with a round tower, is the medieval castle in which the President of Latvia, Dr Ulmanis, now lives

Lutheran in the 16th century, the Latvians and Estonians had to turn with them. The German domination in Livonia and Courland (the southern part of Livonia and the whole of Courland are now the Latvian provinces Latgale, Vidzeme and Kurzeme), was constantly disputed by the Russians from the 14th century, and in Estonia by the Danes. In the 17th century the Swedes under Gustavus Adolphus acquired great power in these regions. Of all the conquerors they alone have left behind a grateful memory. It was in "the good old Swedish time" that education for the people took its rise. Gustavus Adolphus founded the University of Tartu (Dorpat), which he designed as an academy for "dispensing light to the poor of Estonia". The Russians and the Germans between them brought this design to nought. The capture of Riga by Peter the Great in 1710 brought Latvia under the control of Russia until 1917.

But all through the peasantry of Courland and Livonia remained serfs. It was the local German landowners, the 'Baltic Barons', who were their real lords, not the distant government of St Petersburg, which, when it could be got at, was often more benevolent. The Baltic Barons had great influence with the Russian Court and supplied it with many military and civil officials. Though the Russian Government forced the Baltic aristocracy to give liberty to the peasantry of Estonia and Latvia in 1816, their lot remained harsh in the extreme until the World War. A vivid picture of conditions in Estonia is given in *The White Ship*, by Aino Kallas (Cape). In the last quarter of the 19th century, just when the Latvians and Estonians were emerging from their long darkness and beginning to establish a national culture, their efforts were driven underground by the outbreak of 'Russification', which imposed Russian as the language of instruction in schools and colleges and the official speech of the law-court and government.

Ground between the upper and the

Latvian Legation

Bicycle parade of Latvian militia, for whom military service begins at the age of 21 and entails an intensive training period of about 18 months. Officers and N.C.O.s are all 'regulars'

Leta

Symbolical figures on the base of Riga's statue of Liberty, erected in the early 1930's to commemorate the birth of the Latvian State, which was formally proclaimed on November 18, 1918

nether millstone, it is almost miraculous that the Latvians and the Estonians retained their national consciousness. Much is explained by the immense toughness of these peasant peoples, who furnished the most redoubtable and reliable troops in the Tsar's Army, but even more by the tenacity with which the racial soul had been preserved in their wonderful folk-songs and dances. Nor must it be forgotten that their Lutheran faith, despite the fact that their pastors were almost wholly German in speech and culture, had given a deep seriousness to their character. When I was in Estonia I asked a very intelligent university woman how the Christian faith had survived such obstacles. She replied, "The Estonian mother has handed on two things to her children—belief in Christ and the Estonian speech".

Riga still bears traces of all this history. On the fine water-front there stands the medieval castle, now the residence of the President, Dr Ulmanis, a relic of the fortifications which made Riga in the Middle Ages one of the strongest towns in Europe. Then follows a range of spires, the Roman Catholic Church, the Anglican Church, built for the flourishing English community a hundred years ago of English brick, on earth imported from England ; the great 13th-century Cathedral of St Peter, one of the largest ecclesiastical buildings in Northern Europe, with its 18th-century wooden steeple rising to 411 feet, and overtopping all the rest, and the Church of St John. Here is old Riga ; these churches are connected by a network of narrow streets. But the water-front is more modern. Fine buildings of the 18th and 19th centuries make an imposing line, and speak of successful trade of long standing.

Many of these buildings, and especially the Town Hall, reveal to the discerning eye a special note and one that is very characteristic of Riga. At first it seems natural to put them down as German, but it is a German style with a Russian flavour, a style that has come round by St Petersburg, as it were. An older phase is seen again in the building just opposite the Town Hall. The House of the Black Heads, so called because it is decorated with the swarthy figure of the Moorish St Maurice, who was the patron saint of a society of bachelor merchants, to whom the building still belongs. The House of the Black Heads is a relic of Hanseatic times, and has about it an atmosphere like that of the City Companies' Halls in London. A member of the Guild courteously showed us the Napoleonic hats and swords worn by the members of the Guild on great occasions, and also the fine gold and silver plate, which includes cups incorporating Riga thalers, and a fine 16th-century figure of St George. The book containing the rules of the Guild, which dates from the 14th century, is still being used. There is a similar House of the Black Heads in Tallinn. In both places these Houses remained centres of Baltic German influence.

Passing through the city the visitor emerges on a boulevard, where once stood the ancient walls, and is confronted by an immense obelisk 134 feet high, the symbol of the new liberty of Latvia. On the top there stands a statue of Liberty. At the base there are carvings symbolical of the national struggle for freedom, peasants working, singing, and revolting against their oppressors, and figures of the soldiers of the War of Independence. They are splendid pieces of sculpture, into which the soul of the people has entered. By it there always stands an armed soldier, as though to remind all Latvians that hard-won liberty demands vigilance if it is to be preserved.

The most vital embodiment of the soul of the Latvian people is not to be found in the statue of Liberty, imposing as it is. For that one must go to the war cemetery outside Riga. It may seem strange to use the word vital in con-

V. Upitis

The War Cemetery outside Riga in which lie a handful of the men killed in defending their country in the World War and the subsequent War of Independence. It enshrines the spirit of Latvia

nection with a cemetery. Yet it is the right word. The re-birth of Latvia was a birth from the dead and a life won by suffering. In that cemetery there lie the bodies of some 1750 men, known and unknown, who laid down their lives that the Latvian people might live. Of course, they are but a handful of the men whom the nation lost in the World War and afterwards in the War of Independence ; but they represent them. The structure of the cemetery made of Latvian tufa is superb. There can be few finer memorials in any land. The planning of the trees, the vigour of the sculpture, the long vista seen through the entrance gate culminating in the statue of Mother Latvia, the taste and discretion with which the gravestones are arranged, leave an unforgettable impression of artistry purged by the fire of a people's faith.

Two other buildings, the National Theatre and the Opera House, represent a blending of cultures, Russian, German and Latvian, also the national love of song and dance. Russian ballet and Russian opera owed much to this last element. Wagner composed *Rienzi*, the first opera to bring him fame, while he was conductor at Riga. Today the opera is in Latvian, and it draws from every rank of life an audience that expects a high standard of performance. The most characteristic feature of Latvian life, and the same is true in Estonia, is in the realm of music. Like the Welsh, the Latvians and Estonians express their national soul in singing festivals. They began in the Tsarist days. Since 1918 their festivals have been held every five years.

I was fortunate in being present at those held in 1938 at Riga and Tallinn. They took place in a large singing-field on the outskirts of the town. A procession of anything between 16 and 20 thousand singers entered and took their places in

D. Krautes

Foto Kal

Latvians celebrating the Festival of St. John: June 23/4, the old Midsummer Night. Great bonfires are lit and old customs and dances are revived. Men in wreaths of oak-leaves, and women with lime-leaves and flowers in their hair, go like carol-singers from door to door gathering the young people in their wake, giving wreaths to, and receiving beer and cheese from, the farmers and their wives

Estonian girls at a song festival. The national feeling reaches its zenith in musical expression and since 1918 a festival has been held every five years. It is comparable to a Welsh Eisteddfod; but Latvians and Estonians have preserved one thing the Welsh have lost, their gay national dress. Traditional costumes from all the various localities are to be seen on these occasions

Parikas *Erka-Foto*

(Above) *Bringing a catch of fish ashore at the island of Vormsi, once settled by Swedes whose descendants, chiefly peasants and fisher folk, still speak an archaic form of Swedish. The women wear national costume—a loose shirt and finely-pleated black skirt—and are tremendous knitters.* (Right) *A girl from the island of Saaremaa where the Russians have established an air base*

a huge grandstand, while some 100,000 people had assembled in a natural bowl formed by a hillside to hear them. Never anywhere else have I experienced such an atmosphere of irrepressible song except in an Eisteddfod in Wales. But one thing the Latvians and Estonians have preserved that the Welsh have lost, their gay national dresses.

I was able to take note of this especially at Tallinn, as there the festival was preceded by a march past before the President, the 'Grand Old Man', who may almost be called the creator of Estonia, Mr Constantin Paets. I was standing behind him on the platform, and could observe, as the representatives of each district passed by, preceded by a banner

Joh. Triefeldt *Joh. Triefeldt*

(Above) *The Greek Orthodox Monastery, at Petseri, capital of Setumaa, one of the few places where Byzantine influences are still perceptible in local customs and belief. The population is, of course, purely Estonian.* (Left) *Setu women, wearing long white woollen coats, in the market place at Petseri. Embroidered braids hanging down a woman's back indicate that she is married*

bearing its name, what interesting varieties of dress different localities had preserved. The most striking came from the most remote parts, the Setu people near the Russian border and the dwellers in the islands of Saaremaa (Oesel) and Hiiumaa (Dagoe). The islanders got the loudest cheer from the crowd assembled in the Vabaduse Plats (Liberty Square). Among them are a few Swedes by race, who still speak Swedish as it was spoken in the 17th century. But they are generously treated and therefore good Estonian citizens.

From early in the morning we had heard the sounds of singing in the streets, as groups arrived in Tallinn from distant parts. Singing seemed to go on all day. The actual festival occupied many hours

both at Riga and at Tallinn. But nothing, not even the somewhat inclement weather, damped the ardour of singers and audience. After an evening meal it began all over again by torchlight. And what superb singing it was! Most of the items were folk-songs, but there were others by modern composers.

Music-making has never ceased among those people. We met it at every turn. When our delegation arrived at Tartu in 1938, we all had to get out on the platform, to be greeted, in the pouring rain, by anthems and motets sung by the very capable choir of St Peter's Church. And, when the next morning we arrived at Tallinn, we were once more welcomed by a choir at the railway station, which sang what seemed almost a whole liturgy.

Mondiale

Birch woods, fertile arable and pasture lands, rounded hills and wide valleys are the distinguishing features of many a Latvian and Estonian landscape, of which this one, in Latvia, is representative

All this proclaimed peoples who were rejoicing in a long-deferred freedom. The Latvians and the Estonians only got possession of their own country after fierce warfare with Germans and with Bolshevist Russians, both of whom they had driven out during 1919. The grim period of fighting was brought to a close by a treaty between Estonia and the Soviets on February 2, 1920, and between Latvia and the Soviet Government on August 11 in the same year.

Immense social, political, and economic problems confronted the new States. Their position was similar to that of the Irish Free State when it achieved Home Rule. A subject majority and a dispossessed ruling minority faced one another. In both countries the fundamental problem was the land. The peasants had endured the awful sufferings of the war because they hoped that the land, on which they had worked like slaves for many generations, would at last be theirs. Their hopes were realized, and both States developed an economy founded on the strong basis of peasant proprietorship.

In Latvia the big landlords had already left. So there was no question of compensation. The new State divided up the land into a quarter of a million farms, the great majority under 125 acres in extent. About 70 per cent of the two million people of Latvia are engaged in agriculture. They grow all the grain and sugar they need, and they export large quantities of butter and timber, chiefly to Great Britain.

In Estonia two-thirds of the population is engaged in agriculture. The original owners were allowed to retain some part of their property and were compensated for what was taken from them. Many left for Germany, but a number went on

Joh. Triefeldt *Foto Ver*

In Estonia small holdings under peasant proprietorship have superseded the large estates formerly owned by the Baltic Barons, and over 100,000 farms are worked by their owners. New farmsteads grouped along the country roads

Peasant proprietors: a man and his wife who were settled on the land after the establishment of Estonian independence. Some of these small-holders cultivate only a few acres

Erka-Foto

The Ivangorod fortress at Narva, Estonia, on the east bank of the river. It was built by the Russians in 1492, as a gesture of defiance against the Danes who, on the opposite bank, had built—

living in modest fashions on their former estates. Some of the great mansion houses have been turned into agricultural schools, convalescent homes and institutes of one kind or another. One hundred thousand farms are now worked by their owners. In Dr Ulmanis and Mr Paets both countries are fortunate in having at their head men of the land, who thoroughly appreciate the importance of scientific agriculture. Much land has been reclaimed, and its productivity greatly improved since Tsarist days.

The scenery of Latvia and Estonia is very much the same. For the most part it is rolling country, pleasant rather than exciting. Two features will always remain in the mind of the traveller. There is plenty of water, small lakes continually add variety to the scene. The other outstanding feature is the woodlands. There are, of course, many fir trees. But the characteristic tree of the Baltic lands is the birch. The silvery trunk and shimmering leaves give a lightness to the landscape that the sombre pine forests of the German lands too often miss.

Riga remains a great port, despite the loss of most of the trade from its natural hinterland of Russia. Out of it pass the flax, timber and butter, and into it come the agricultural and other machinery, much of it from England. The blue omnibuses which contribute a bright colour to the streets of Riga are made by Leyland. We brought one over with us on our boat. Much business is concentrated in this city of 400,000 people.

While the Baltic Germans largely disappeared from the countryside, many stayed on in Riga and the other towns because their business was there. It must not be supposed that all the so-called Germans were really German by race.

Any young Latvian under the old regime who wanted to get on had either to become Germanised or Russified. If he wanted to go into business he adopted German speech or culture, if into the Army or the Civil Service, he took up Russian. Three-quarters of the people of Latvia are Latvian-speaking, twelve per cent speak Russian as their home language, and three per cent speak, or rather spoke, German. The Jews, who are five per cent of the population and prominent in business, are mostly concentrated in Riga.

The Baltic Germans who remained in the towns formed a valuable element in the business life of Latvia and also in Estonia, though they were less numerous there (only 1·5 per cent). As the years passed they were gradually becoming more reconciled to co-operating with the Latvians and Estonians, whom they had despised. This was made all the easier by the wise and generous policy of the new States, which allowed all the minorities to form their own autonomous institutions for the promotion of their national culture and welfare, so long as these did not run contrary to the interests of the State. When the Nazi regime came into power all this began to change. Alfred Rosenberg, author of *The Myth of the Twentieth Century*, was a Balt from Tallinn, where he was at school with a friend of mine, who remembered him as a brooding boy, brought up by an aunt, and stuffing himself with unrelated knowledge. It was the passion of his life to bring 'Estland' and 'Lettland' within the Third Reich. Intense propaganda excited the younger generation of 'Germans' and unsettled the older.

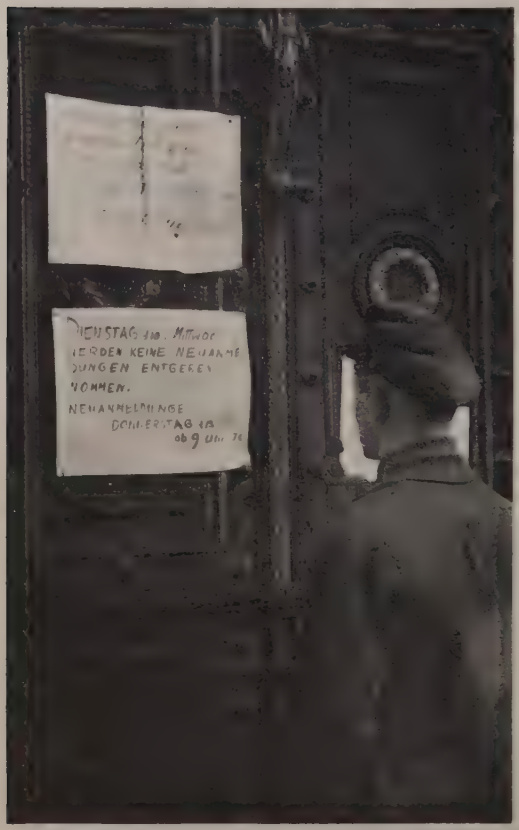
Then came the astonishing reversal! Hitler and Stalin agreed to the military domination of the Baltic lands by Russia in exchange for the Baltic Germans whom

Erka-Foto

—the Hermann Fortress, towards the end of the 13th century, to protect the Hanseatic City of Narva, founded by the Danes in 1223 and settled by merchants who traded with their Russian neighbours

Hitler wanted to plant in Poland in order to substantiate his claim on Poznan and Pomorze. The order went forth that they must 'return home' at once. What could it mean? The German Lutheran Bishop in Latvia, Dr Poelchau, immediately announced, "When the Fuehrer calls, we must go!"

The day after Hitler's speech eight ships arrived to take them away. Like sheep responding to the shepherd's call, in their thousands the Balts packed up what they could, abandoned their homes, their schools, their churches, their theatres, cut a thousand ties with the life they had shared for generations, and set out for an unknown future in a land which was



Wide World

A German Balt, to be uprooted from Estonia by Hitler's orders, studying an evacuation notice displayed on the door of the Consulate at Tallinn

for most of them not even Germany, but the devastated provinces of Poland. Some 50,000 went from Latvia; fewer, but still a considerable number, from Estonia. A Norwegian journalist described the piteous lot of the older people in the words of one of them, "A whirlwind has seized us. We're swept away, we don't know where to."

Hard also was the fate of those Germans who had married into Latvian families. What has happened to these uprooted folk? A Belgian journalist has reported that some 48,000 Germans from Latvia and 12,000 from Estonia are scattered over districts of Poznan and Pomorze. They are having great difficulties in this "purely German country". Acts of vengeance by the Poles are common, which is not surprising since the Poles are being turned out to make way for the Germans. A typical case occurred in Poznan. A German hairdresser, who had just attended to a Polish customer and was taking his money, was shot dead by the customer. The Pole shot himself afterwards. He had been turned out of the business to make way for the Baltic German.

The immigrants have found no Paradise. They are mostly middle-class townspeople, and they have been set to work in fields and farms under the very necessary protection of the Storm Troops and secret police. Former bankers and business men are to be seen running military soup canteens.

What is the condition of Latvia and Estonia, now purged of their German elements? The Governments have taken over many of the businesses, but they have anxieties of their own. Russian troops are in possession of military bases at Ventspils and Liepaja in Latvia; in Estonia they have established themselves on the islands, at the charming watering-place of Haapsalu and at Port Baltiski. So far as I have heard, the Russians have not yet interfered with the internal life of the country, and, of course, the Russian

N. Nylander

Tallinn, formerly Revel, capital of Estonia, is like Riga and Narva a Hanseatic City and contains many medieval remains. It has the appearance of a fairy city straight out of Grimm's Tales

troops must be kept out of contact with the Latvians and Estonians, lest they discover how much happier life is for the ordinary man and woman in these 'bourgeois' lands than in Soviet Russia. But the occupation is particularly bitter for the Estonians, because it is from their islands that Russian planes set forth to bomb the Finns, who are their blood brothers and speak what is substantially the same language.

The menace of the Stalinite tyranny hangs over the heads of the people, who after twenty years of well-justified freedom find themselves once more between the upper and the nether millstone.

My mind goes back to two things. I visited the Russian frontier at two points, and saw the double rows of barbed wire and the rifleman in his wooden tower, where watch has been kept day and night throughout these years. Of what avail is that now? The other memory is that ancient home of Christian sanctity, the monastery at Petseri, one of the few bits of Orthodox Russia remaining. In long catacombs below the earth lie generations of monks, while a handful of their successors carry on the holy rites and the monastic life in the ancient churches, dark but glistening above, a place of pilgrimage and inspiration to the minority of Russians who escaped being engulfed, and also to the Estonians, who feel the charm of an institution that contains priceless relics of centuries of history from the time of Ivan the Terrible onwards. Mr Paets, the President of Estonia, is himself a member of the Orthodox minority, a fact that reminds one that the authoritarian rule in Estonia is not fundamentally anti-democratic.

As we left Tallinn and saw that fairy city, that seems to have stepped straight out of Grimm, fade into the clouds, we could not but fervently wish that, come what may, these gallant virile people will preserve their identity and their faith.

Earthquakes

by ERNEST TILLOTSON

EARTHQUAKES from time immemorial have attracted the attention of the world's greatest thinkers. That they continue to do so is no wonder for two outstanding reasons: they cause tremendous havoc, and, though we know a great deal about them, they still present some of the greatest enigmas known to science.

It is rare for a day to pass without an earthquake happening somewhere in the world and on many days there are three or four. Some of these are small earth tremors not felt by man and only recorded by instruments so delicate as to be capable of measuring ground movements of two thousandths of an inch. Such a one happened in Paris about 1.30 A.M. on Wednesday, January 17, 1940, and was recorded at the Paris Observatory. Some are of terrific magnitude but fortunately happen miles from the nearest human dwelling, thus doing no damage. Such a one was the Aleutian Islands shock of Thursday, November 10, 1938, which was recorded by seismographs throughout the world, caused a seismic sea wave which rolled up on the beach at Hawaii, and did so little damage that *The Times* in a leading article wished " that all upheavals could spend their force with so little damage:

> Thundering like ramping hosts of warrior horse,
> To throw that faint thin line upon the shore,

and so pass innocuous into silence". But such is not to be, as we have lately seen in the earthquake disaster which has overcome Turkey.

Scales of seismic intensity such as the Rossi-Forel Scale and the modified Mercalli Scale of 1931 enable seismologists to classify earthquakes according to their intensities and to determine roughly the areas from which they started (epicentral area). But probably one of the greatest desires of every student of earthquakes is to be able to forecast the exact time and place of the next great earthquake. Unfortunately it is not yet possible to do so. That there are certain periodicities in the occurrence of earthquakes is not generally accepted by seismologists, and though foreshocks do sometimes occur before a large earthquake, as on November 23, 1939, and other days in Anatolia before the Turkish disaster of December 26, 1939, yet they are not often recognized as such, but only considered as separate individual earthquakes and tremors. There is a known tendency of earthquakes to recur in areas where they have once happened but the time or magnitude of the next occurrence cannot be foretold.

Long before the great Chilean Earthquake of January 24, 1939, the ground was known to be tilting gradually and this was recorded and commented upon by the Chilean seismologists, but it was impossible to say when or exactly where the earthquake would occur or whether the ground tension and compression would become dissipated in bending and in a series of small shocks which would do no material damage. In Japan changes in earth currents of electricity have been shown to precede certain earthquakes but these changes sometimes occur without earthquakes happening afterwards. Certain areas near the Himalayas have been found by the Survey of India to be deficient in the force of gravity. According to the hypothesis of Isostasy these areas are uncompensated and thereby unstable. Earthquakes have occurred near these places and there is without doubt some correlation between the facts though, as with the ground-tilting in Chile, the time, exact place and magnitude of possible earthquakes cannot be estimated in advance. The forecasting of earthquakes is one of the enigmas.

MYTHOLOGICAL THEORIES

From the earliest times men have sought to explain why the solid ground beneath their feet should suddenly and without apparent warning begin to shake in all manner of complicated ways. Very early these were mere speculations often bound up with the local mythology. In Japan the shakings were supposed to be due to the movement of a subterranean mythical earth spider or *jishin mushi* which later in history became a cat-fish. There is a rock at Kashima some 60 miles north-east of Tokyo which was said to rest on the head of this creature to keep it quiet. In Mongolia the earth-shaker is a subterranean hog. In Scandinavia there was supposed to be a god of evil genius, by name Loki, who killed his brother Baldur. As punishment he was bound to a rock, face upwards, so that the poison of a serpent could drop on his face. Loki's wife usually intercepted the poison in a dish but when she went to empty the dish the poison dropped on the prostrate deity causing him to writhe in agony and shake the earth. The philosophies of Aristotle, Pliny, and others, including the Chinese, concerning earthquakes, based on the fact that they had seen steam and other gases arising from volcanic vents, held that earthquakes were due to the workings of wind or imprisoned vapour beneath the earth's crust.

In more recent times a great many more observations have been made and theories concerning earthquake origins must take account

of all these multitudinous facts. It is now generally accepted that earthquakes have been known to have had their origins from points in the earth's surface down to points at depths of at least 364 miles. Light local earthquakes and earth tremors have been found to be due to the collapse of underground caverns and workings and to the slipping along local fault planes: for instance, those felt regularly at Comrie in Perthshire owing to the slipping of the Highland Boundary Fault, the mine shake of November 12, 1938, at Brierley in Yorkshire and those felt on relatively rare occasions in the Settle district in Yorkshire owing to movements of the Craven Fault.

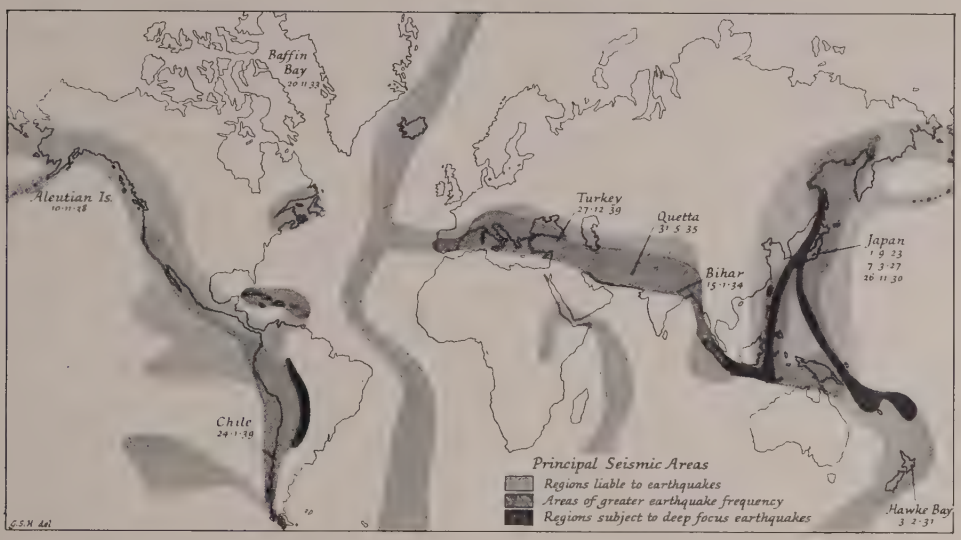
NORMAL AND DEEP FOCUS EARTHQUAKES

Minor earthquakes are also known to have been due to the activities of volcanoes such as those of the volcano Kusatu-Sirane from November, 1937, to February, 1939. The swarm of shocks at Montserrat in the West Indies are alternatively thought to be correlated with the geyser activity or the collapse of underground caverns in the limestone. Normal earthquakes, however, are at present thought to originate at depths of between $5\frac{1}{4}$ and 16 miles below the earth's surface, intermediate ones between depths of 32 and 160 miles and deep focus ones below this.

Professor Gutenberg, of the California Institute of Technology, is of the opinion that the large shear waves observed in deep focus earthquakes leave no doubt that the causative mechanism cannot be of an explosive character, but, as in the case of normal shocks, must depend on the release of strains. Dr. K. E. Bullen, of Auckland University College, New Zealand, has noted that at depths of about 364 miles there appears to be a rapid increase in velocity of seismic waves, a rapid increase in the density of material, and an increase in electrical conductivity, all pointing to a change in the properties of the material of which the earth is composed at this depth.

Really deep focus earthquakes have been found to occur chiefly between the Japanese Islands and the Dutch East Indies, between Japan and a point to the north of New Zealand, and a few in western South America. Intermediate and normal earthquakes have been found to occur chiefly along the well established belts shown in the map.

These belts are conspicuously related to the surface geology and fall close to the tectonic lines of Tertiary or recent mountain building. In the East Indies they are close to the areas of large gravity anomalies.



It thus appears probable that the problem of the origin of normal earthquakes is bound up with the problem of the origin of mountain chains. From the time when it was first imagined that the earth had originated from a molten body, the effect of the cooling of this was seen to produce shrinkage. Since the solid crust formed, this crust would have to adapt itself to the shrinking interior. The forces in the crust would be mostly horizontal, but, since the elastic properties of the crust are not uniform, the forces need not be wholly horizontal. As soon as these stresses become greater than the breaking strength of the material, the material ruptures and earthquakes result; should the viscous strength be reached first, plastic flow sets in and although mountains are produced no earthquake happens.

The discovery of radioactively generated heat just below the earth's surface has led some to throw doubt on the efficacy of this cooling process to produce mountains and thus earthquakes, at any rate during recent geological times.

Other long period forces discussed have been the movement of the continents (Polflucht of Wegener), tidal and other friction, secular movements of the earth's axis and changes in latitude. Changes which have occupied long periods of time so far as a human life is concerned, but short periods according to geological history, are: deviation from hydrostatic equilibrium of the crust; chemical processes; cosmic sources of energy; thermal differences between ocean bottoms and continents; changes in air-pressure; body tides; erosion;

sedimentation; forming or melting of ice; variation in sea-level due to storms and tides; freezing of ground; seasonal changes in the temperature of the ground; vertical movements of blocks in the earth's crust and such like.

Various authors have discussed the possibility of convection currents within the region immediately under the earth's crust. Professor Daly, of Harvard University, has advanced a hypothesis whereby large blocks of the earth's crust slide under the action of gravitational forces to fold and thrust the more superficial, geosynclinal rocks thus forming the mountain chains and incidentally causing earthquakes. Science, requiring more data, still regards the long range cause of earthquakes as an enigma. Whatever this cause or these causes may be, the process of the accumulation of strain prior to an earthquake is very insidious and it remains for some 'trigger' action at the last moment to precipitate the shock. This trigger action may be one of those forces already mentioned or in some cases it is an earthquake in another part of the world which sends out elastic waves in all directions. The second earthquake may then be termed a sympathetic earthquake. Some of these may have occurred in Los Angeles, in San Salvador, in the Rand near Johannesburg and in Tangier following the recent Turkish earthquake.

RECENT GREAT EARTHQUAKES

Some of the major earthquakes within living memory have undoubtedly been the Kwanto (Japan) earthquake of 1923 which nearly destroyed Tokyo and Yokohama; the Tango (Japan) earthquake of 1927; the Idu (Japan) earthquake of 1930; the Hawkes Bay (New Zealand) earthquake of 1931; in India, the Bihar earthquake of 1934 and the Quetta earthquake of 1935; the Chilean earthquake of 1939; and the Turkish earthquake of 1939. All of these occurred in well established seismic zones where lighter earthquakes are by no means uncommon. It is very rare for earthquakes even as great as the Baffin Bay earthquake of 1933, to occur in places other than the usual zones. These zones must therefore be considered as inherent lines of weakness in the earth's crustal and subcrustal structure where the numerous and varied forces acting within and without the world finally cause disruption of the crust.

The Hawkes Bay earthquake of February 3, 1931, occurred without any warning at 10.47 A.M. New Zealand Summer Time in the region of Napier and Hastings. At Napier eyewitnesses saw buildings sway

to an alarming extent, telegraph poles lean over at critical angles, cracks and fissures appear both in the walls of buildings and on the surface of streets, whilst control of motor cars became a matter of great difficulty owing to the peculiar nature of the earth-movement. Those who were not pinioned in buildings by the first shock had just reached the footpath when there came a second downward bump and many buildings collapsed. Owing to the scattering of fires in buildings numerous fires broke out in the town. About 260 people were killed and many injured, which constituted the greatest natural calamity since the foundation of the Dominion.

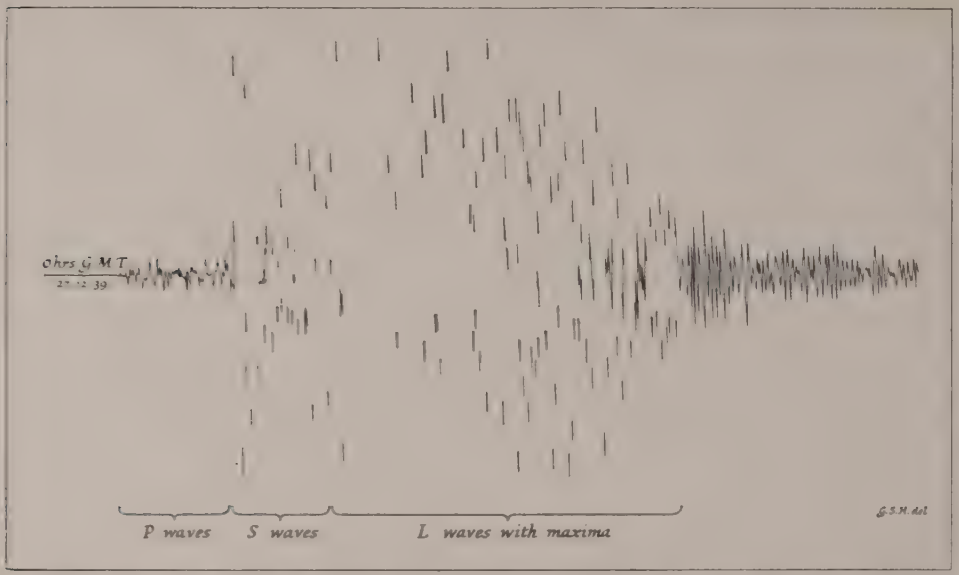
The Quetta earthquake of May 31, 1935, was one of the most destructive to human life of all known Indian earthquakes. Chiefly owing to the badly constructed buildings, 26,000 out of a population of 40,000 were killed, and after the earthquake the city was cleared of survivors and 'sealed' for a year as a precaution against the spread of disease. The disturbed area covered a band 70 miles long and 15 miles wide, running from Quetta through Mastung to midway between Mastung and Kalat.

The Chilean earthquake of January 24, 1939, occurred at about 11.35 P.M. (local time). It had an epicentre near Chillan which was practically wrecked. The disastrously affected area reached Parral in the north and Concepcion in the west, and upwards of 20,000 people were killed, many more being injured. Such earthquakes as these have led to the formulation of schemes for earthquake insurance and to the better design of earthquake-proof buildings.

THE TURKISH DISASTER

The greatest earthquake ever recorded in Turkey happened at about 1.57 A.M. (local time) on December 27, 1939, when an area in Anatolia including Erzinjan and Erbaa was completely devastated, and the surrounding district including Sivas and Tokat badly damaged. The loss of life was tremendous, estimates varying from the official figure of 23,131 dead and 7994 injured to unofficial estimates of 45,000 killed and 20,000 injured. The high death roll was in part due to the thick-walled mud houses of the peasants collapsing on them whilst they were in bed.

This earthquake was recorded at observatories throughout the world on seismographs, many of which in effect are horizontal pendulums carrying a heavy inertia mass. The relative movement of the mass and the rest of the apparatus causes a pen at the end of the pendulum



From seismogram obtained at Stonyhurst College Observatory for Turkish earthquake; sketch begins midnight December 26-27; time scale is such that Primary waves begin at 3 minutes 40 seconds past midnight and last for approximately 5 minutes before Secondary waves come

to write on paper fixed to a rotating drum the record of the earthquake. Time marks are also made on the paper. I am indebted to Rev. J. P. Rowland, S.J., for the Stonyhurst record of the recent Turkish earthquake reproduced above. It was obtained with a Milne-Shaw seismograph registering optically with a galvanometer. The first waves to arrive have come through the body of the earth. They are the P (Primary or Push) waves. Then come the S (Secondary or Shake) waves and finally the waves which have come round the surface of the earth called L and M waves, for the knowledge of which we owe so much to Dr R. Stoneley. It will be noticed that for this particular earthquake the surface waves are extremely large. They exceeded the limits of registration at Kew and unhinged the seismograph at West Bromwich, Faenza (Italy) and some of the Swiss observatories. Knowing the speeds at which the P and S waves travel, it is possible by observing the time interval between the arrival of these at an observatory to estimate the distance of the epicentre of the shock from the station. Doing the same for several observatories enables the epicentre to be determined approximately by drawing the arcual distances on a globe. Thence the original time of the earthquake may be determined.

Using observations from 15 observatories, Monsieur A. Hée has found the epicentre of the Turkish earthquake to be near latitude

39°.5 N., longitude 38°.2 E. and the time when it happened to be near 23 h. 57 m. 23 s. Greenwich Mean Time.

In any particular earthquake, should the arcual distances not quite intersect, the earthquake focus is known to be at some distance below the earth's surface and the depth of focus may be calculated. Should the records of the earthquake exhibit large P and S waves and no L and M (surface) waves the earthquake is thought to have had a very deep focus. In that case waves peculiar to deep focus earthquakes are also discernible, and the arcual distance together with the initial time and depth of focus may be found by using special graphs prepared by Rev. G. J. Brunner, S.J., and Rev. J. B. Macelwane, S.J., of the St Louis University, U.S.A.

SEISMOLOGICAL DEDUCTIONS

By identifying other waves seen on seismograms, students of seismology have drawn conclusions concerning the properties of the materials deep down in the earth and the structure of the earth. It appears that if we take the earth to be a sphere of nearly 4000 miles radius, the core has a radius of approximately 2200 miles and is made of more dense material than the remainder. The core of the earth appears to possess some of the properties of a liquid in that, according to general acceptance, it will not transmit S waves directly through the centre. Waves from an earthquake near to an observatory enable the crustal structure to be determined. Underneath the sedimentary surface rocks of variable thickness there appears to be from the surface downwards first a layer of granitic material estimated from $6\frac{1}{4}$ to $7\frac{3}{4}$ miles thick, then a layer of intermediate material from $9\frac{1}{2}$ to $10\frac{1}{2}$ miles thick, and underneath that basaltic material becoming more dense towards the core, with possible discontinuities.

Artificial earthquakes caused by exploding charges of dynamite sunk in the ground have been used to determine the thickness of the ice-cap in Greenland and other places; to determine the position and size of salt domes in prospecting for oil; and to determine the geological structure including the depth of the sedimentary rocks in various parts of the world. This work is done by portable seismographs and in the case of prospecting for oil has saved the companies thousands of pounds in avoiding unnecessary drilling.

Castles in Syria

II. Moslem

by FREYA STARK

Miss Stark's first article on Syrian castles, which appeared in December, was devoted to the Crusader castles and their background—the valley of the Orontes where the Christian lands ended and the Moslem lands began. To those Moslem lands and their association with the Crusades, as well as to the castles built there by the Arabs, she now turns

THERE is still something of adventure in the crossing of the Euphrates, in spite of tourists who have done so before you and of the Turkish girders that span it close below the mound of Carchemish. If the bridge belonged to any but a leisurely Oriental nation, it would be arranged to carry cars as well as trucks, and the Euphrates would cease to be a barrier during the many hours that pass between the morning and evening train: but as it is, the bridge is there, unattainable to the motorist as Paradise to a Peri, and he is as likely as not to spend five hours on Euphrates bank before he gets across. The old rectangular pontoon that ferries him is nearly always on the farther side. In May, when corn is ripening, and the snows are melting in far Armenia, the great river is a mile across in places; it runs swift, with a pink light in it, given by the swimming grains of sand. It is an exciting thing to get your first glimpse of, as you drive gingerly in and out of the bumps of a track that has led you by many dead or diminished sites of antiquity over hills clothed in one unending garment of corn. The whole world, you would think, could feed from the lands of the upper Euphrates. The corn is not sown in patches, or divided into fields: it is thrown over the hills like a cover of green satin, yellowing with age where the sun has caught it; when a breeze blows, the whole land shines where the stalks bend, as far as the eye can see. And when you have crossed, and reached the rich eastern Gezira, you drive again through cornland, for hours and hours. All this immensity is cut by the far-spaced villagers, by hand with little crooked sickles.

To cross the river needs certainly the better part of an afternoon; and lucky for you if you have a car, for then the ferrymen, casting a weary look to your shouts across the water, will show a certain activity, usually in the shape of increased conversation with whatever camelmen or donkeys they are arguing with upon the other side. They will gradually clear their old craft of whatever is inside it, and pushing out until they reach the current, will disappear from your regret-

All photographs by Freya Stark

Euphrates ferrymen and, behind, those arid cliffs that have shone through all the history of mankind

ful sight downstream. The fact is, that during the six thousand years or more that they have plied this trade, the Euphrates ferryman has not yet invented or adopted an oar: thin scraggy poles, crooked at that, are all he has wherewith to breast his stream; and you see him waving them, like a drowning spider his legs, while "the majestic river floated on".

Now, however, you know that all is well: the slow process has commenced which in the course of time will carry you and your car: you settle down to the treeless peace of those shores whose white and arid cliffs have shone through all the history of mankind. With the weight of all their centuries about you, you feel that it is foolish indeed to boggle over the waste of an afternoon. In the course of an hour or two small figures appear round the bend, tugging at a rope: the old pontoon heaves slowly into sight: a point is found on the ever-changing bank hard enough to bear car wheels; and the Present is superimposed on the Past, with infinitely delicate handling so that its wheels do not sink into the vacant middle of the pontoon. Donkeys and travellers on foot have gathered, grateful for the (comparative) rapidity inspired by the West, and settle themselves inside: the donkeys, used to this exercise, skip with a ballet-dancing neatness over the over-hanging pontoon ledge: and you are out, this time with the current in your favour, drifting rapidly with a slow circular motion, like that of the earth round the sun.

It appears that these Euphrates ferries are farmed out by Government; 1500 Syrian livres, or about £170 yearly, is, they tell us, the rent for the crossing at Sirrin, which it would require 70 passengers a day to cover, apart from the three boatmen's wages, who get one franc each, or 1½d., for every journey across and back. The income, however, is made rather on sacks of corn after harvest, of which hundreds of thousands must be ferried over, at 4 piasters each, forty at a time.

We had come to the Euphrates to visit

The citadel of Aleppo showing the sloping, stone-covered bank, or glacis, used by Moslem architects as a means of increasing solidity in an area where earthquakes occurred

Qal'at al-Nejm, the Fortress of the Star, which stands upon the western bank. I had said, tentatively, that the Arab castles did not seem to me as well built as the Christian, and had been asked in reply whether I had yet seen Qal'at al-Nejm. It is indeed very different from the great tower-flanked walls of the Crusaders, but equally impressive, standing circular, with sloping walls from whose surface spring shallow buttresses. The sloping glacis is, I believe, supposed to be an Arab invention adopted by the Crusaders, and its object an increase of solidity in a country of earthquakes: it is used for the interior fortress at Crac des Chevaliers and at Belfort in Palestine; but the Moslems used it for the outside of their fortifications, as at Salhad in Hauran, or at Aleppo where the very mound of the citadel was covered with smooth stone. At Nejm, the slope of the walls continues the hillside slope at a steeper angle: the gate on its arched bridge-way is ruined,—across its broken pier one looks straight down to Euphrates below; but in the interior the walls of smooth and yellow stone, the long outer corridor with skylights, the vaulted rooms and central donjon keep are largely standing, and the great pile, so firmly seated, is nakedly solid, like an incarnation of the landscape.

Nothing, I believe, is known of its history, except that it obviously guarded the fords of the Euphrates; as you see it from the opposite bank, across the dull, imprisoned glitter of the river, it looks indeed like a star in an empty and burnt-out firmament, for the cornland is hidden on either side behind low tawny ranges that break to the water's edge, and leave nothing in sight but waterless soil or flat and muddy islands.

When you visit it, you realize for the first time how shallow indeed was the penetration of the Crusaders into this vast Island of the Arabs. Marching from Constantinople through Asia Minor in A.D.

(Above) *Looking down at the Euphrates from Qal'at al-Nejm, the Fortress of the Star. It differs in character from the tower-flanked walls of the Crusader castles, but is equally impressive, and nakedly solid, like an incarnation of the landscape.* (Below) *Remains of vaulted rooms and donjon*

1098, they first settled permanently in the lands of Antioch. The story of the siege of that great city, which lasted eight months, the privations and disease, the heroism of French and Norman nobles, great names, De Bouillon, Tancred, Bohemond, Raymond de Toulouse, are given in day-to-day chronicles of William of Tyre, and others. Tancred first climbed the wall of Antioch by night, let in by an Armenian friend: native Christian help to the invaders shows clearly in the histories: the country of Rohez, Edessa or Urfa—the most easterly and transitory point of Crusader penetration beyond Euphrates—was chiefly gained by Christian intrigues in the towns; and the Frankish nobles, marrying the daughters of their native allies, soon degenerated in the ease of eastern life. The first two iron generations passed away, decimated rapidly by disease: the killing of the heavy-armoured knights in battle was comparatively rare. They died of fevers and dysenteries, and their new fiefs passed in a rapid accumulation to their widows, whose female intrigues soon caused many difficulties in the Crusading world. But in the first rush of ardour they had reached and captured Jerusalem after a five-weeks' siege. Godefroy de Bouillon, never crowned, ruled there for a year and was followed by seven kings, all able administrators and fine fighters, until in 1186 the crown fell into the unworthy hands of Guy de Lusignan.

By this time interest in Europe had flagged and a distinct division is noticeable between the resident Christian nobles and those occasional new-comers who reached the Holy Land. Such dissensions brought to nothing all attempts to conquer Damascus. Surprise too had worn off: the Moslems had grown accustomed to the men in armour whose first appearance carried all before it: their tactics were known and imitated. The coastlands, which the Crusaders captured, had always possessed a very mixed population, largely Christian; their nearness to the sea made reinforcements easy; and, even now, in the hills, the secret sects of Ansayriye or Druzes like to trace back their ancestry to the Crusades. But in the interior, the cities of Damascus, Homs, Hama, Aleppo—links in the chain of trade between Bagdad and Egypt—remained strongly Moslem and formed a barrier which no force from Europe could lightly overthrow. In the 14th century it seemed possible that the Christian kingdom might survive. The forces of Islam were divided: the Fatimite power in Egypt was opposed to the Seljuks of Damascus, Aleppo, Mosul and Bagdad: the policy of Jerusalem, and especially of the two great fighting orders on which the protection of the Christian kingdom largely devolved, became one of balance and alliance between these opposing forces.

In the year 1164 King Amalric—ever bitterly pressed for money—engaged himself to fight for the Fatimite caliphs of Egypt against the Seljuks: it was the fatal turning point in the history of the Crusades. The effort failed; the Egyptians and their allies were defeated by the elderly Kurd Shirkuh and his young nephew Saladin: the two Islamic powers, now combined in one extremely able hand, and extending from the Nile to the Tigris, were bound to be too strong for the Crusaders: with unfailing courage, but with ever-dwindling numbers, they fought a losing battle. The field of Hattin in 1187 lost Jerusalem; the struggle went on, however; the great fortresses fall gradually at long intervals, one after another, their almost impregnable walls garrisoned by an ever more inadequate number of men, until the last of the Crusading armies sail from Château Pelerin, the modern Athlit, and the great adventure is over, leaving little behind it except the military magnificence of its ruins, the vividness of its old histories both on one side and the other, and local hatreds between sect and sect, and village and village, which have survived scarcely diminished to this day.

At the present time one is told that Syria

The beduin who pasture their flocks by the Euphrates live now as they did in Abraham's day

contains eighteen religions and one free-thinker. The roots of its varied life plunge deep into a past usually far more remote than that of the Crusades; but a difference between the Christian and Moslem districts of that time can still be faintly traced. The dividing line was the Orontes, in whose marshy valley opposing garrisons would meet to hunt or skirmish as the case might be. There, where the river runs in a sharp defile, stands Moslem Sheizar, whose masters spent their time impartially fighting Tripoli, Antioch or Hama. One of the most delightful memoirs of the time was written by the old lord of Sheizar, Osama ibn Munqidh. He tells of his first battle as a young lad beside his uncle and father; of the art of holding lances in a tilt; of the hunting of lions in the marshy lands; of Christian want of faith and the stealing of his 4000 books in spite of a safe-conduct, "a matter which will burn my heart to the end of my days". In his casual colloquial pages, the gossip of the little border garrison stands out in vivid detail, until one feels a real and intimate affection for the feudal household that held the Orontes bridge.

Meanwhile to south and east the ancient life of Arabia went on more or less unchanged. The decline of these provinces had already long ago taken place: the rich towns with their aqueducts and porticoes had sunk to bee-hive villages where, lost in some ditch or half buried, fragments of marble columns may yet be found: but the crowd that comes in daily to the markets of Aleppo must be very much the same crowd that the Crusader saw if he travelled across the pass from Antioch with safe-conduct.

Red-headed peasants in striped gowns show perhaps some trace of strange and northern ancestry; but among them all the beduin in their abbas and sheepskins, who pasture their flocks by the Euphrates streams, are the same as those who first came wandering when Abraham led his flocks westward from the lands of Ur.

Over the Roof of Europe

Climbing Mont Blanc

Notes and Photographs by F. S. Smythe

Stanford, London.

In August 1939, Captain J. M. L. Gavin and I traversed Mont Blanc from the Trélatête Hotel at the western extremity of the Alps to the Torino Hut in the east. Given perfect weather and perfect snow conditions, there is no finer Alpine traverse than this. It took us three days. Leaving the Hotel shortly before dawn, we spent the first day crossing the beautiful ridges of the Aiguille de Béranger and the Dôme de Miage. The second day we spent in crossing the Aiguille de Bionnassay (the finest snow and ice peak on the range of Mont Blanc and one of the most beautiful in the Alps) and the Dôme du Goûter to the Vallot Hut on Mont Blanc. The summit of Mont Blanc itself was attained on the morning of the third day and it was then decided to descend, not by the Mont Maudit–Mont Blanc de Tacul route, by which Mont Blanc is usually ascended from the east, but by the classic Brenva route to the Torino Hut on the Col du Géant. These photographs were taken as we went along. They depict better than words the marvellous weather that prevailed in the Alps during most of August which made it possible to bask on Mont Blanc in shirt-sleeves; we and many other mountaineers who experienced it will remember it with gratitude through these dark days of war.

The map above shows our route, as we travelled in an easterly direction, and the places at which we stopped.

After spending the night at the Durier Hut on the Col de Miage (11,015 feet) in the company of a guided party of three Frenchmen, we were away at dawn and set off to climb the Aiguille de Bionnassay (13,295 feet) by the south ridge. This is a continuously steep and difficult rock- snow- and ice-climb. Two hours later, we approached the summit a few minutes ahead of the French party two of whom are seen in this photograph

The final slope of the Aiguille de Bionnassay sweeps up in a parabola of snow to end in a horizontal ridge, a perfect blade of pure snow. From the summit the climber looks down on Saint-Gervais-les-Bains ten thousand feet beneath. The great massif of Mont Blanc dominates the east falling with terrific steepness into Italy, whilst in the north lie the ranges of Savoy, the uneven edge of the Dent du Midi and the tranquil blue of Geneva. As a view it is more impressive than that from Mont Blanc

From the summit of the Aiguille de Bionnassay we descended to the Col de Bionnassay, which lies between th peak and the Dôme du Goûter (14,120 feet). The route follows along the side of a sharp snow crest. In the pic ture a party of two women and a guide who ascended the mountain by a different route from ours are descending Quite the wrong climbing technique is being exhibited and the rope appears to be of little use as it is not tau

Taking things very easily, indeed dawdling along in brilliant sun, we joined the Dôme route up Mont Blanc, by which the mountain is most often climbed from Italy, and followed it over the Dôme du Goûter. Late in the afternoon we trod the snows of the latter peak and I took this photograph looking westwards to the Aiguille de Bionnassay. Atmospheric conditions were as perfect for photography as they were to the eye. A delicate haze filled the valleys, and through it and above rose ridge after ridge of distant mountains. The sunlight was mellowing—a little later filling earth and atmosphere with gold. It would be difficult to imagine a more beautiful evening. The air was unmoving, like deep quiescent water, and not a sound broke the solemn stillness of the high snows. Mont Blanc, which can be the most terrible of all Alpine peaks for bad weather, slept unstirring in dreamless serenity

The Vallot Hut, where we spent the second night, is 14,310 feet above the sea and is situated on the Rocher des Bosses. It was erected originally as a meteorological observatory but an additional all-metal hut has recently been built for the benefit of mountaineers. After a long hot day we arrived, very thirsty, and drank many cups of a re-heated coloured liquid which the hut guardian assured us was tea, and for which, as we discovered later, we had to pay ten francs per cup. After a night in this exclusive abode, second only in height and expensiveness to the hut on the Italian summit of Monte Rosa, we continued our way. From the hut we followed the ordinary route up Mont Blanc, which consists simply of an enormous groove worn in the snow by hundreds of tourists and their guides up which a Fordson tractor might be driven with ease and equanimity

The tourist who successfully shoves and jostles his way up the ordinary Chamonix route to the summit of Mont Blanc (15,780 feet) is rewarded with a panorama so extensive that the eye is unable to appreciate its scale and magnificence. It would be difficult to say offhand exactly how much of Europe can be seen. The Black Forest may or may not be visible, but the Jura certainly is, whilst southwards it is possible to imagine the distant shimmer of the Mediterranean far beyond the shapely peak of Monte Viso. Looking south-east in the direction of the Aosta Valley, which lies beneath the clouds

From the summit of Mont Blanc to the Col de la Brenva is merely a downhill walk. We then turned to the south and climbed down the upper slopes of the Brenva to the famous ice ridge. In this photograph the ice ridge is seen from the uppermost end. We completed the traverse by crossing the Col de la Fourche to the Géant glacier and the Torino Hut on the Col du Géant, thus ending three days of the grandest mountaineering we had ever enjoyed

last photograph was taken from the upper séracs of the Brenva route and shows one of the great ice cliffs which the climber must force his way. The Italian ranges and the Aosta valley are in the background

The Land of the Baigas

by VERRIER ELWIN

The land of the Baigas is a block of country in the east of the Satpura Mountains, that great plateau which runs across the centre of India from Amarkantak to the Arabian Sea. Parts of the Satpuras are comparatively civilized, but in the extreme east the country becomes wild and lonely, covered with thick forest, to form the Maikal Range. This Range is famous as the home of some of the greatest saints of Indian legend; Vyasa, Brighu and Agastya retired here to seek the eternal in the depths of their own spirits and in the vast solitude of the trees.

This is the home of the Baigas, the most primitive and interesting of all the tribes of this part of India. The Baigas themselves are probably a branch of the great Bhuiya tribe which still numbers half a million in Bengal and Bihar. It is probable that they were the earliest inhabitants of the Chhattisgarh plain, and later moved up into the wild and inhospitable hills on its borders. Today they are to be found, between forty and fifty thousand all told, in the British districts of Mandla (the home of nearly half the tribe), Jubbulpore, Balaghat and Bilaspur, and in the Kawardha and Rewa States.

Here they live as the magicians and priests of a slightly younger and much more numerous tribe, the Gonds. The Gonds were once lords of this country; then there were Gond kingdoms and great Gond estates, ruled by care-free indolent monarchs, peopled by a contented peasantry. But as the centuries passed, wave upon wave of alien invasion beat upon them, the kingdoms fell to ruin, their broad acres shrank and dwindled, and the tribes retired to the remotest summits of the hills, and hid themselves in the vast lonely jungles.

Such are the Gonds. But the Baigas were never rich or powerful. Born from the womb of Mother Earth, it was ordained that they should live close to the earth for ever and sustain her. It was Nanga Baigin, mother of the tribe, who, when the primeval world was first balanced unsteadily upon the waters, drove nails into its four corners to make it firm. It was Nanga Baiga, her husband, to whom God gave the power to bind the mouths of all wild animals. Even today it is in the ear of the Baiga wizard that Mother Earth whispers her secrets of the crops and seasons. If an earthquake troubles the world, it is a Baiga

who must go and drive a fresh nail into the ground to make it firm again; if a man is killed by a tiger, it is a Baiga who must repair the magic boundaries of the village; when sowing-time comes round, it is the Baiga who must whisper charms of fertility into the seed.

The Gonds are of royal blood, princely, kings of this passing world; the Baigas are ecclesiastics, priests, lords of the world beyond. But both belong to the same soil; they sustain and protect it; they are *Bhumiaraj*, lords of the earth, *Bhumijan*, people of the land.

The Baigas live in little villages as far away from other people as possible. If they can, they build at the top of some steep, almost perpendicular pass, reached only by narrow footpaths along which a party must walk in single file. They are frightened of strangers, and an unexpected visitor may send them all running away into the jungle.

I once found a village scatter like this before me, and when I asked the reason, I was told that the Baigas thought I was an official of the Public Works Department. A bridge had collapsed and they were afraid that I had come to get a little child to bury alive in the foundations!

The houses, which are small thatched huts, with bamboo walls lightly plastered with mud, are built round a large square; the plan of the village fosters the corporate life of the people, which is marked by energy, equality and loyalty to the tribal law.

But the houses are usually tumble-down, for the Baigas are always on the move and take little trouble over their buildings. Yet they have the knack of creating a home; dark, messy, smelling eternally of woodsmoke and cooking food, yet cosy, happy, a place of warmth and affection; it may not be a permanent dwelling, but it is a good tent on life's high-road.

Everyone is struck by the charm and distinction of the Baigas. In a bazaar, their almost naked bodies, their wild and tangled hair, lithe wiry limbs, fine heads and often striking features, make them immediately noticeable. The men are much better looking than the women, who are often dumpy, heavy, squat, with enormous thighs and calves, thick ankles, more in them of Audrey than of Tess. They do not bother much about their clothes, for they have an old tradition of nudity.

At the beginning of things God offered Nanga Baiga a piece of cloth nine yards long, but he tore off a yard and a half and returned the remainder as unnecessary.

It is the hair to which the young Baiga gallant gives his chief attention. It is worn long and oiled, then tied in a bun which hangs on the left side of the head. Girls strain it back and tie it in a knot with flowers and balls of coloured wool. The best magicians achieve long pig-tails which they say grow by magic. The most popular love-gifts are little wooden combs and a pretty girl may have half a dozen, all from different admirers, stuck in her hair.

The Baigas are generally credited with the belief that if they wash they will be eaten by a tiger. But they are every bit as clean as their neighbours, and those who live near a stream delight in constant bathing and swimming. They only wash their clothes, however, once a month, boiling them in water mixed with fine wood-ash, then rinsing them in the nearest stream.

They have lost all traces of their own Austro-Asiatic language, and today speak the tongue of their neighbours, in Bilaspur ordinary Chhattisgarhi, in Mandla Eastern Hindi, and in Balaghat a mixture of Marathi, Hindi and Gondi.

The Baigas make their living by shifting cultivation, hunting, fishing, basket-making, gathering jungle roots and fruit, and performing the duties of sacrifice and divination for their neighbours.

Shifting cultivation, or *bewar*, is agriculture without the plough. It is still practised in many parts of the world. The method is to cut down a patch of jungle, let it dry, fire it shortly before the rains, and then sow the seed in the ashes. Splendid crops are raised in the first year, but the second year is less successful, and after that the Baiga moves on, and does further damage to the forest.

But the Baiga regard bewar as a religious duty. They are the children of Mother Earth, and it would be sacrilege for them to tear the breast of their Mother with the plough. The administration forced many Baigas to abandon their old custom some forty years ago—and there is a tradition that on the day they first touched the plough a child died in every house. But even now there are thousands of Baigas who have refused to change their ways and who still are allowed to practice bewar in the remoter jungles. The bewar-cutting Baigas do not thresh their grain in the usual way with bullocks, but they form a procession and go round and round stamping it out with their feet and excitedly shouting their forest songs.

In the old days, before the passing of the game acts, the Baigas were

A young Baiga archer. His arrow is poisoned with the deadly aconitum ferox *and with it he can kill even tigers. Every animal killed is commemorated by a little band of silk, tied round the shaft of the bow, smeared with its blood. The Baigas live in little villages, as inaccessible and as far away from other people as possible. They are frightened of strangers and the sight of an unexpected visitor will send them running off to take cover in the jungle. They have never been rich or powerful but have for generations lived close to the earth, hunting, fishing, basket-making, gathering roots and fruit and performing the duties of sacrifice and divination for their neighbours, the Gonds*

(Above) *A young Gond whose bearing suggests her royal lineage. Now, her people live on hill tops and in lonely jungles.* (Right) *A Baiga village beauty. Poor as lack of ornaments shows her to be, she has the charm and distinction—and the tangled hair—common to her tribe*

mighty hunters. Many of them are still adept with the bow and arrow and the spear. They are expert trappers, and set traps all round their clearings in the jungle. They also make many kinds of bamboo fishing traps; fish-eating, they think, is good for the eyes.

But their main source of food is wild nature herself; the Baigas are specialists in jungle roots, of which they distinguish many varieties. At the end of the hot weather they make up parties and go out to picnic for days at a time under the wild mango trees. These excursions are the happiest times of their lives; boys and girls, men and women, dancing and singing, go through the great forest, sucking the juice of the fresh green mangoes. One of the Dadaria, or Forest Songs, illustrates the many reasons why the Baigas are indebted to their forest. The song is a dialogue between a girl and her lover.

Girl: Come, take your spud and we'll go for roots.
Listen to my songs with your left ear.
Boy: I'm going to the jungle for jamun berries.
How I long for you! Come and sit with me.
Girl: I've come to the jungle to gather thorns.
I weep with desire for a faithful lover.
Boy: I've come to the jungle to kill a wood-pigeon.
My love, I will leave everything for you.
Girl: I've come to the jungle to gather leaves.
'Tis in our youth we must take delight.
Boy: I've come to the jungle to kill a porcupine.
Let us live together all our life long.

The leaves are to make broad plates for supper, the thorns are to fence the garden.

But the Baiga derives his main income, such as it is, from his magical and priestly duties.

The Baigas regard themselves and are generally believed to be the most powerful magicians in the world. And this is important in a universe where nothing happens by chance, where every event derives from some hidden supernatural cause. If the milk turns sour, a witch has cast a spell upon it. If a child falls ill, a jealous ancestor has attacked it. If a tiger kills a bullock, someone in the village has committed a breach of tribal law, and opened the herd to the revenge of the gods. Nothing happens by chance; Nature always has something up her sleeve.

The primary duty of the magician is to fight disease and death, to

diagnose its cause and then defeat it. But he must also make the course of love run smoothly; he must stimulate the growth of crops and protect them from hail, blight and jungle pig; he must keep cows from straying; he must direct the arrow to its mark; he must lay the ghost of the dead, shut the mouth of the tiger, protect from snake and scorpion, and even save his village from the exactions of officials. Thus regarded, the religion of animism takes on a new aspect; we can see it as a valiant battle against all the mysterious enemies of mankind, enemies that lurk in every tree and behind every stone. The *gunia* or magician assumes heroic qualities; he stands between mankind and all the malignant forces of Nature and Super-nature; his only weapons are a frail stick of straw and a winnowing-fan; but he has authority handed down to him from remote antiquity, and his knowledge is more than a match for all the hostile powers.

The Baiga magician does his work in many different ways. Magic, for example, is a vital part of the grand business of love; it is the artistic touch added to an intrigue. Love-magic works largely by suggestion. A charm is prepared by mixing some of the powdered bones of a crane with dust from your girl's footprints in a little butter, and this is smeared on the girl's back by a friend. This at once proves, of course, the seriousness of your intentions, and the girl becomes 'uneasy as a fish in a dried-up stream', until she decides to accept you.

The magician has control of the weather. To make rain he yokes two naked girls to a plough and makes them drag it along a piece of sand. To stop rain, he catches the first few drops and buries them. To check a hail storm he catches a few hail stones and blows them away towards another village.

The Baigas have a special intimacy with all wild animals. The chief magicians are supposed to go abroad in the company of tigers and leopards. If a tiger attacks the village cattle, the Baiga goes round the boundaries of the village and drives nails into the trees. Then he stands on one leg and recites a charm to drive the enemy away. A very solemn ceremony is held when a man-eater claims a victim, for unless the ghost of the dead man is laid it will trouble his friends and family. One of the magicians becomes possessed by the tiger-spirit and behaves exactly like a tiger; he is hunted through the jungle and at last captured. The driving of the nails into a tree is believed to shut the mouth of the tiger so that it dies of hunger; and there are stories of trees deeply

scarred with claw-marks, showing where the tigers have tried to remove the nails that were condemning them to starvation.

For the diagnosis of disease, the Baigas employ a method very similar to table-turning. Sometimes the magician takes a lighted lamp in his hand, holding it by a string so that it can sway freely. He then asks a number of questions; if the lamp sways one way it means 'Yes', if another way, it means 'No'. In this manner they gradually narrow the field of possibility until the culprit or enemy is discovered. At other times, the magician takes the sacred winnowing-fan and puts a little rice in it. A disciple sits opposite with a gourd. The magician rubs his hand over the rice and mutters charms until he is in a sort of trance. Then he asks his questions, and the disciple answers yes or no by shaking the gourd in a special way. A simple and popular method of divination is with two bits of straw pulled out of a broom. The straws are measured again and again with the palm of the hand. If they lengthen, the answer is yes; if they are found shorter it is no.

Once the magician discovers the cause of an illness, the rest is simple. There is a regular tariff of sacrifices to be offered to angry god, or jealous ancestor, or vindictive ghost. A chicken or a goat is offered and the patient recovers. Should the disease be due to witchcraft the witch must be beaten or tortured until she agrees to remove her evil spell.

Diseases of the throat are generally ascribed to Narayan Deo, the Sun God, and he has to be appeased by the offering of a pig. The pig is dedicated and kept for three years, after which it is sacrificed by being bumped up and down, head downwards, in a hole full of water, while the onlookers scream obscene songs and throw cow-dung at one another.

Every year the magicians perform the Bida rites to purify the village. This is the great prophylactic, a sort of sanitation drive along the supernormal boundaries of the world. A little cart is made and all the evil spirits are put in it and carried out of the village, and sent into the jungle. Sometimes the disease is put on a scapegoat or a chicken which is driven out and allowed to die in the jungle.

The Baigas have many curious ways of keeping off disease. One is to hang a tiny pair of scales over the doorway; the evil spirit will be attracted by these and will spend all night playing with them, and go away without doing harm. Another method is to scatter parched rice round your bed, and the spirit will spend his time eating this and forget about you. At a marriage a cake full of tiny hairs is put outside the

house, so that Matia—a spirit that brings bad luck to brides—will occupy itself trying to pull out the hairs and eat the cake.

Dancing, singing, the telling of stories and posing of riddles occupies the Baigas' leisure hours. Every Baiga child knows scores of riddles, some of them very clever. A razor is described as 'a little plough that wanders fearlessly through the jungle' of the beard; a fly is 'a beggar-boy who sups with a king'; a hen is 'a little old woman with a bundle of rags on her back'. And again—'Where the creeper goes, the beans follow'. That is 'fish in a stream'. And 'From one grain of rice, there is a houseful of husks'. The answer is 'a lighted lamp'.

The Baiga child is, indeed, a highly privileged person. He is 'the godling of the house' and has almost complete freedom. Boys and girls are equally welcomed by their parents. Great care is taken soon after birth to ensure the best possible future for the child. His instep is rubbed with rabbit's droppings to make him run quickly; a little piece of the tree-rat is given him to make him a good climber. His first teeth are thrown up on to the roof with the cry, "O cat, take away these teeth and give some of your sharp bright ones instead."

There is a children's festival. All the boys dress, or rather undress, as holy men, smearing themselves with ashes, and sometimes wearing grotesque masks. They beg food and when they have enough, they go to the nearest stream and the girls cook for them. One of the boys represents a crow and is chased away from the feast, probably a piece of magic to banish birds from the crops. During the rains also, the boys go about on stilts with the idea of making the rice grow as tall as they are, and at the end of the rains they make a pile of the stilts and burn them —as the wind carries away the ashes, so it will blow away all disease.

As for games—what Baiga children, like most other children, like most is to jump off things and roll about. They adore rolling over and over in the soft warm sand of a river-bed. Their most successful games are improvised, like 'Bazaars', when they perform miracles of imaginary bargaining with leaves, stones and bits of stick, or 'Houses', when they build little shelters in the woods and set up house with one another. They play Cock and Hen, and Elephants, Hide and Seek and Dolls like other children. They also have a form of Blind-man's-buff, and Hunt-the-slipper. The most famous and characteristic of the Baiga games is, however, the Kanda-kel or Root game. Boys sit in a row with legs extended. Little bits of wood, the roots, are placed between their

toes. Two children are chosen to be the man and wife who own this garden of roots. They pretend to water, and fence their field; they bump the boys' heads on the ground to represent the double planting of the roots. Others play at being ants and pinch them. Then a policeman comes and carries off one of the roots, a thief comes for another; in chasing these the game comes to an end.

The Baigas are apt to be visited by strange commands from the gods, generally through dreams. Some time ago a magician dreamt that everyone in his village must be married within twenty-four hours. The next day there was tremendous activity and all the unmarried children were married to anyone or anything available. Four little boys were married to one girl, and another child was married to a cat. At the end of the day only one boy, who was deaf and dumb, was forgotten; but within a week he was dead.

Another curious incident occurred in the village in which I was living. The Baigas have a custom of covenants of friendship; boys or girls make a solemn pact which lasts for life and has a ceremony of initiation. One of these grades of friendship, the *sakhi*, is always made between families which have the same number of children. One day a sow had a litter of six males and one female. In the village there was a family of six boys and a girl. The magician had a dream that these children must, on pain of death, enter into a covenant of friendship with the little pigs. And so they did.

Few Westerners have come in contact with the Baigas. Their country lies off the beaten track, their most characteristic villages lie twenty or thirty miles from motorable roads. It is not generally realized how little India is influenced by the West. The latest History of British Rule in India points out that 'outside the great cities only an infinitesimal part of the population is brought into contact with the English, and probably most Indians live and die without even seeing one'. Again and again I have been to Baiga villages which have not been visited by any Westerner within living memory: hundreds of them have never seen a motor-car, still less a train, while no aeroplane has yet flown over Baiga-land.

So we must leave this delightful and virile people in their remote and beautiful country, fighting the battle of civilization (as they see it) against all the hostile powers of Nature and Super-nature. The Baigas are powerful in magic, powerful too to charm the hearts of all who know them.